

# The Australasian MANUFACTURER

SERVING ALL INDUSTRY

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Saturday, October 28, 1950.

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# AFTER BUSINESS HOURS

## A Bacchanalian Pilgrim's Progress

[The following was an extremely entertaining discourse given recently by a well-known Adelaide musician, Mr. John Horner, at a meeting of the Bacchus Club in Adelaide.]

One of the best books I've read on the general application of music was one called "A Musical Pilgrim's Progress", by J. D. M. Rorke, published perhaps 30 years ago. It described the musical development of the author, from the early days of pianolas, when he developed an entirely uninstructed passion for Chopin's music, through a later stage with the first gramophones, when he went crazy over Beethoven's string quartets, up to the period when he wrote the book. I've forgotten what his latest craze was just then, but I always remember how his passion for the things he liked was quite infectious and instructive even to a trained musi-

ean, in spite of the author's completely spasmodic and patchy knowledge of the subject.

In the agreeable matter of grog, I suppose that this Bacchus Club has discussed the subject from nearly every conceivable angle in the course of its formal and informal activities. But it occurred to me, when I received the very flattering invitation to speak to you to-day, that, from the heights of experience and knowledge which you gentlemen adorn you might care to look down with kindly interest or, at least, forbearance, for a few minutes while I attempt to recall the more memorable steps in the Bacchanalian Pilgrim's Progress that for me has reached its climax here to-day.

On both sides of the blanket I come from uncompromising lines of rabid Scottish teetotalers. I have never dared to trace my ancestry further back than three generations. As far back as that,

no member of my family had ever been known to allow alcohol to pass his lips, except at the doctor's orders or at the Lord's supper. To us all varieties of grog were slumped together under the dread name of "Drink." Of doubtful characters it would be asked in a hushed tone, "Does he drink?" No one who "drank" was ever invited to our house.

I may say outright that I have nothing but admiration for the motives of my parents in this matter. They were not fanatical, merely prudent. In Glasgow, where they belonged, drink was a public nuisance. It meant the Cowcaddens, the Gorbals and Argyll Street on a Saturday night, when a few bad whiskies set everyone thinking, "Glesca belongs to me." The favourite method of settling any arguments about this question was to sail right in, give all you'd got and take all that was coming to you—no holds barred, except that ladies were not allowed to hold each other by the hair at least not by the hair of the head. When unconscious semi-naked Amazons were seen being dragged off by the policeman (known locally as the poilis-man) everyone muttered "Drink," and they were quite right.

My parents were prudent, not only in inculcating in their children the perfectly accurate idea that drink meant social risk, in any case, they couldn't afford to drink, and that alone made it wrong to drink. They were not fanatical and they were not unkind. I remember once when the local soak in our suburb, had collapsed in the gutter and some of us, coming off the 5.15 train, had helped to carry his unsavoury corpse into the nearby undertakers, my father asked me rather secretly afterwards if he had smelt of drink. I confessed that there had perhaps been just a slightly perceptible suggestion of an alcoholic odour permeating the district; whereupon my father said very earnestly, "Don't mention it to anyone will you?" Such parents are the salt of the earth.

It was to my maternal grandfather that I owed my first stolen glimpse of the forbidden grogs. He was a sprightly old warrior who used to delight in shelling the lugs off his grandchildren. His nickname for me was "Buggerlugs." He used to travel for the Imperial Tobacco Company of Great Britain. His suitcases smelt marvellously of cigars. In a corner of his great old-fashioned sideboard he kept a

bottle of Scotch—for purely medicinal purposes, he would explain. When the house was empty, I used to pinch lumps of loaf-sugar from the pantry, soak them in whisky and crunch them with solemn deliberation and gusto. Scotch (and sugar) was the first drink I really liked, and the only one I had any opportunity of cultivating before the first World War.

At 18, I joined the Royal Flying Corps—out of sheer foolish bravado, as far as I can remember. Here, drinking was completely beyond me, for the simple reason that, even as a cadet, I received a salary of one shilling per day, and my people could give me no allowance. Drinking there was in plenty all around, but it was quite out of the question for me. At Farnborough, the young flying officers went strutting around in fur collars, gloves, and long hair, as drunk as lords every night. Only by their incongruous riding breeches could you distinguish them from famous pianists. But all this was not for me.

However, the great day dawned; I was gazetted at last, and my salary jumped from £18 a year to £400, a financial disaster from which I have never fully recovered. Before I had time to change my habits I found myself posted to Italy. I spent a night in Paris on the way through. Believe it or not, I slept at the Y.M.C.A.

It was in Italy that the habits of generations were overthrown. I can still remember the officers' mess of 139 squadron in 1918 in a tin Nissen hut at Villavetba, somewhere north of Verona. At the head of the table was the C.O.—only 22 himself—a Canadian—Major W. G. Barker V.C., D.S.O. and bar, M.C. and 2 bars, Croix de Guerre and Italian Silver Medal, and 60 odd E.A.—and with him a mixed bag of seasoned toughs. Both the Flight Commanders were Australians—Dalrymple and Hursthouse. Down at the kitchen-end were all the latest recruits—18-year-old office boys, most of us—trying hard to look as tho' we belonged. I had kept off the grog till after dinner. Then, for the loyal toast, some of my new friends ordered me a creme de menthe. I have never looked back.

I had sipped beer before that, and spat it out. Memories of Argyll Street on a Saturday night kept me off the straight spirits. But this smooth caressing creme de menthe was something quite irresistible—something to dream

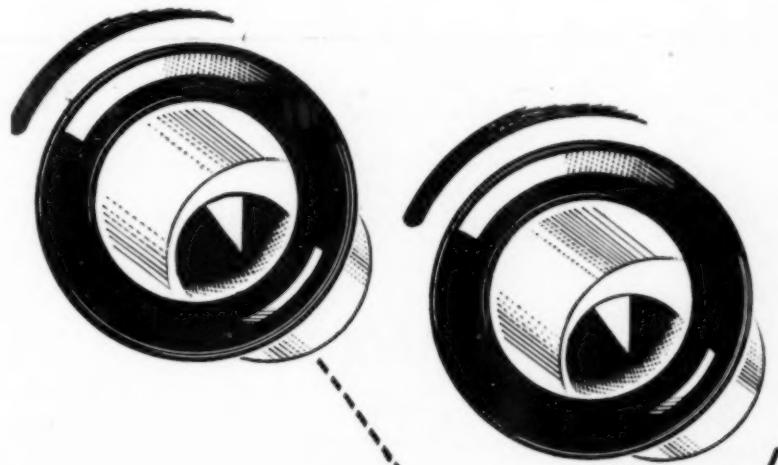
(Turn to page 32)

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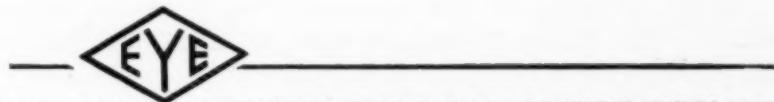
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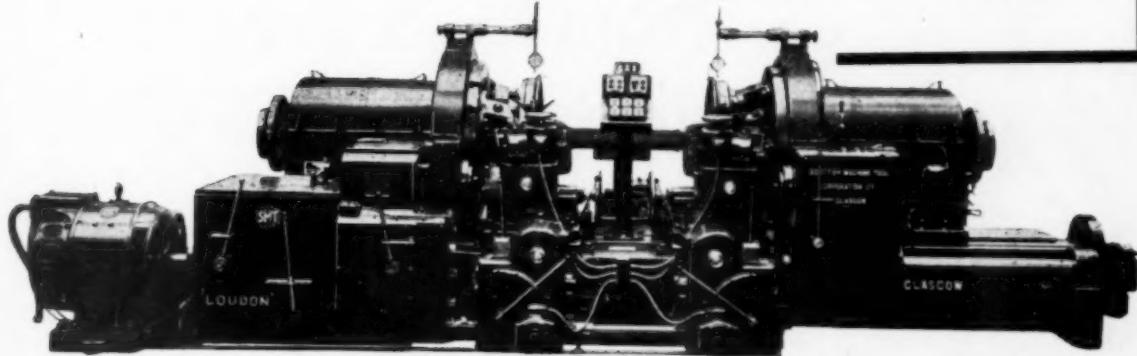
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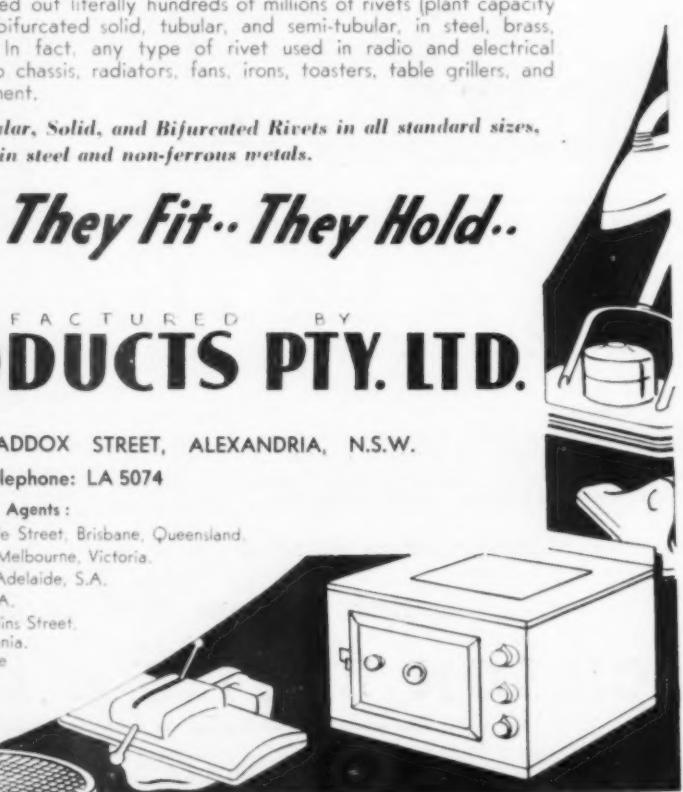
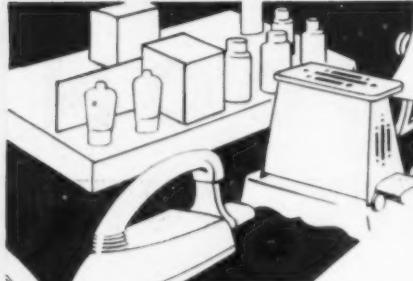
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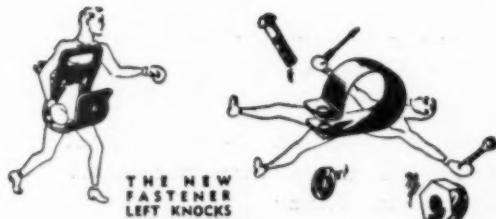
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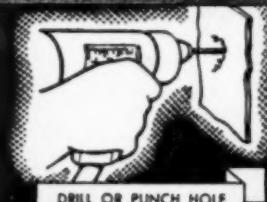
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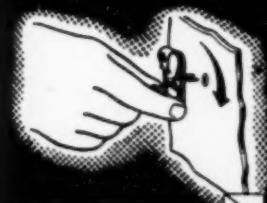
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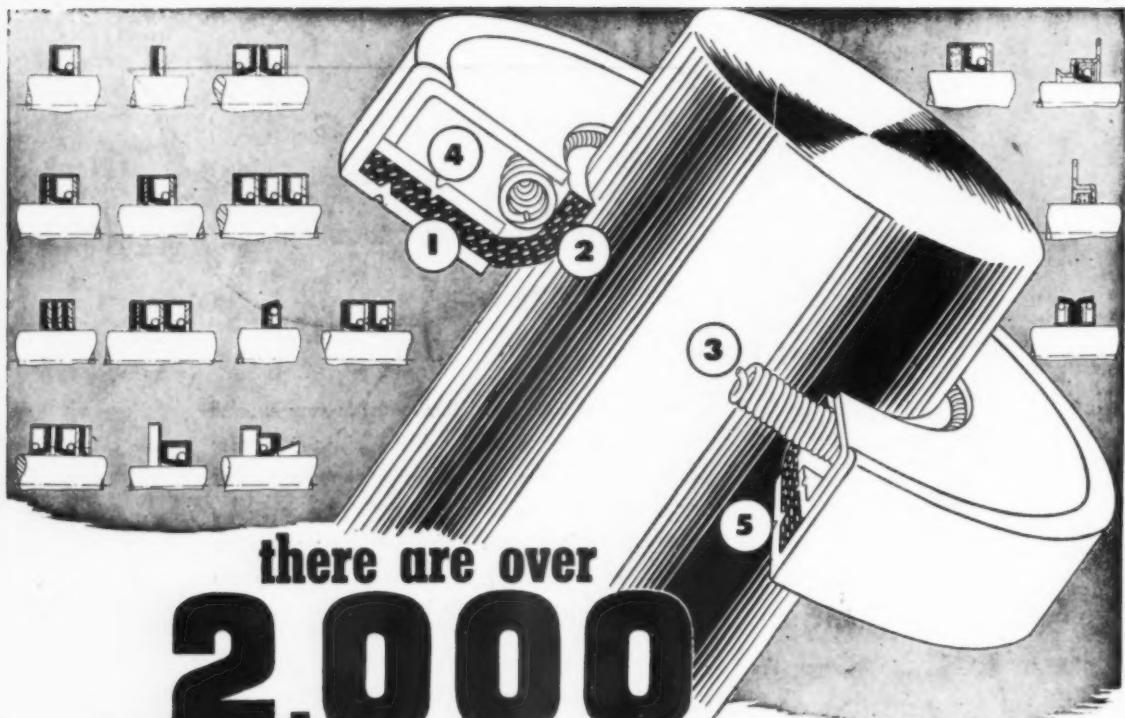
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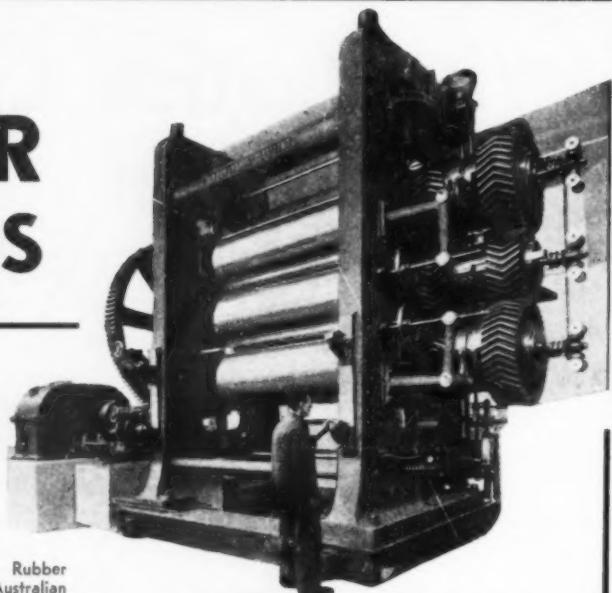
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50° C.	21.5	23	19.5
100° C.	15.5	14	8.5
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Breaking Load at 20° C.	24,600 lbs. 27,000 lbs.	27,000 lbs.	21,600 lbs.
Compression at Breaking Load at 20° C.	38 to 38%	40%	30%
Load with 2% Compression at 20° C.	12,500 lbs.	14,000 lbs.	13,000 lbs.
Breaking Load at 100° C.	12,500 lbs.	12,000 lbs.	12,200 lbs.
Compression at Breaking Load at 100° C.	40 to 45%	40%	56%
Load with 2% Compression at 100° C.	10,000 lbs.	8,500 lbs.	7,300 lbs.
Admissible Load at—			
V = 2.02 Ft./Sec.	2,133 lbs./Sq. In.	1,990 lbs./Sq. In.	
V = 3.44 Ft./Sec.	2,133 lbs./Sq. In.	1,777 lbs./Sq. In.	
V = 6.89 Ft./Sec.	1,777 lbs./Sq. In.	1,777 lbs./Sq. In.	
V = 8.94 Ft./Sec.	1,777 lbs./Sq. In.	1,630 lbs./Sq. In.	
V = 13.12 Ft./Sec.	365 lbs./Sq. In.	380 lbs./Sq. In.	
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V = 2.02 Ft./Sec.	4,433 lbs./Sq. In. Ft./Sec.	4,106 lbs./Sq. In. Ft./Sec.	
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PAGE FIFTEEN OCTOBER 28, 1950.



## Increased Productivity and Industrial Survival Their Close Interdependence

"The drift in productivity is Australia's greatest source of economic disorder and solution of the difficulty, is the nation's greatest problem. Unless production increases greatly, Australia will face the high jump."—Professor Sir Douglas Copland, Vice-Chancellor of the Australian National University at Canberra, in a recent address to the Institute of Sales and Business Management, Sydney.

DEFINING productivity as the level of output per man per year, Sir Douglas recorded the lamentable fact that during the past decade Australian productivity has made practically no increase. "At most," he added, "it has expanded at the rate of one per cent. a year."

He then proceeded to discuss the main contributing causes to this virtual deadlock, contending that while due regard must be paid to the effects of the shorter working week, the major cause is the failure of Government, management, and labour to respond effectively to the changed conditions of the present-day economy. "The economy," he declared, "needs a vital change of attitude by management and labour and, to a lesser extent, by Government to develop the team spirit necessary to raise output. In Britain, Government, management, and labour combine to point out the advantages that spring from increased production... It is no accident that productivity in Australia is standing still, whilst Britain's is rising at the rate of 6 per cent. per annum."

Australia's industrial trinity—Government, management, and labour—must, accordingly, recast and modernise their views on the production issue, each recognising the importance of the part to be played and determining that maximum effort shall be put into the job.

Sir Douglas regards a statesmanlike lead from the Government as the first essential. "Perhaps," he says, "the most important requirement is a clear lead from the Government, and it now appears, following the Prime Minister's recent speech on inflation, that the Government will give such a lead." The Australian industrial world awaits developments in this regard with the keenest of interest.

"The Manufacturer" feels that Sir Douglas is distinctly unfair to management when he contends that its chief contributions to the solution of the production problem are "exhortations." "These exhortations," he said, "often take the form of castigation of Labour's attitude, and so neglect the positive contribution management itself could make." What of the installation by management of the most modern machines and machine tools? Of the employment of the latest manufacturing pro-

cesses? Of the utilisation of the newest techniques? Of the initiation of incentive systems? Of the establishment of Shop Committees? Of the provision of the most up-to-date and hygienic working conditions? Of the establishment of welfare and recreational facilities? Are none of these to be ranked as positive contributions? Admittedly, all of these modern facilities may not be available in every factory and engineering plant throughout the land. But this journal has no hesitation in declaring that they are forthcoming in the overwhelming majority and, as such, make a positive and highly significant contribution to the attainment of higher output.

When every aspect is carefully studied, however, it becomes abundantly plain that the whole crux of the situation is the approach of the trade-union movement to continuity and increase of production. "There is," Sir Douglas emphasises, "the need for a changed attitude on the part of labour. Workers should understand clearly that they have nothing to lose by higher productivity and much to gain. To convince Labour that it has about reached the limit of achievement in redistributing income is most important. Continued Labour progress depends on a revised attitude to the level of output."

This revised attitude already has been attained by the workers of Britain and the workers of the United States. This is evident from the rising level of productivity in the United Kingdom—some 6 per cent. as already quoted—and the spectacular rise in the United States, where physical production is approximately double the pre-war figure, though the labour force has been increased by less than half.

The recognition by a large and powerful section of American labour, of the interdependence of high productivity and high living standards, was voiced in the five-year industrial peace treaty recently concluded between General Motors of America and the United Automobile Workers' Union, this treaty stating, inter alia: "The annual improvement factor provided herein recognises that a continuing improvement in the standard of living of employees depends upon technological

progress, better tools, methods, processes, and equipment, and a co-operative attitude on the part of all parties in such progress. It further recognises the principle that to produce more with the same amount of human effort is a sound economic and social objective."

The elucidation of these fundamental facts to the workers of Australia is unquestionably the major present-day task of the trade-union movement. Indeed, the measure of its skill and its earnestness in the execution of this task may well be deemed the determining factor in

this nation's future manufacturing expansion and development—hence its survival as a modern Industrial Power.

Management is ever willing to meet the workers half-way; to discuss their problems with them; to endeavour to see their point of view; to co-operate actively in any plans to promote improved relations.

An honest fair-minded approach to the closely-intertwined questions of human relationships and higher productivity could work veritable miracles along the entire Production Front.

## Pithy Jottings of Industry and Industrialists

### QUARTERLY BASIC WAGE RISE IN NOVEMBER.

The Registrar of the Commonwealth Arbitration Court, Mr. J. F. Taylor, announced during the past week that the basic wage is to increase in all States as from the first pay period in November. Rises and new basic wages will be: Sydney, 4/- (17/6/-); Melbourne, 3/- (17/3/-); Brisbane, 3/- (16/15/-); Hobart, 4/- (16/19/-); Adelaide, 3/- (16/17/-); and Perth, 3/- (16/19/-). The rise will be additional to the £1 weekly increase granted by the Arbitration Court on October 12th.

### "FRIGIDAIRE" TRADE MARK.

On page 77 of our July 1st issue appeared a reported decision of the Supreme Court of Canada expunging the trade mark "Frigidaire".

This bald statement, we are informed by General Motors-Holden's Limited, is apt to be misleading both to manufacturers and the public, because the expungement of "Frigidaire" was a purely technical proceeding under the Act, because the trade mark registered in 1929 had not been accompanied by a declaration that the word Frigidaire had acquired a secondary and distinctive meaning as required by Section 29 of the Canadian Act.

The expungement judgment actually incorporated a Court declaration that the word Frigidaire had acquired a secondary and distinctive meaning, remedying the original defect, and enabling an effective registration to be made.

Pursuant to the judgment of the Exchequer Court, confirmed

by the Supreme Court of Canada, the Frigidaire Trade Mark was registered on the 24th April, 1950, claiming use of the mark since September 21, 1918, in the U.S.A. and since before 1926 in Canada. The Canadian trade mark "Frigidaire" is now fully protected and the defect of the original registration has been corrected.

In Australia, the Registrar declared as far back as 1930 that the word "Frigidaire" be deemed a distinctive mark and under Trade Mark Law in Australia, the trade mark "Frigidaire" is fully protected.

### DEATH OF AIR CONDITIONING PIONEER.

The death has been announced of Dr. Willis H. Carrier, founder of the Carrier Corporation of America, and acknowledged as the father of Air Conditioning. He was particularly famous for his rational psychrometric formulae which formed the basis of air conditioning as an exact science. Dr. Carrier visited Australia during 1936 in the course of a tour of inspection of the international activities of the organisation.

### MUST WORK FOR PRODUCTION.

There was only one way in which Australia could get greater production, and that was for someone to do the work, the Victorian Premier, Mr. McDonald, said during the week.

Mr. McDonald said that there were already too many committees saying what should be done, but refusing to set an example. They would be better engaged in

production because they were only keeping people out of it.

"We are not suffering from a dearth of planners, plotters and blue-printers," he said, "but we do seem to be having grievous trouble in getting people to put their ideas into effect. No one has yet discovered an effective substitute for work."

### OLD. REPRESENTATIVE FOR A. S. HORNE.

Mr. W. T. Phillips, who until recently was New South Wales country representative for A. S. Horne Ltd., glove manufacturers, of Prospect, South Australia, has transferred his activities to Brisbane. He has several agencies there and is now direct Queensland representative for A. S. Horne Ltd. for both industrial and fashion gloves. He is at Heindorf House, 171 Queen Street, Brisbane.

### ENGINEERING SCHOLARSHIP IS COMMENDABLE MOVE.

In an effort to encourage the entry into industry of highly skilled and capable craftsmen, the 20th Century Mechanical Exhibition of Melbourne introduced a worth-while technical scholarship.

The scholarship is valued at £200, tenable for a full-time diploma course in any branch of engineering in a senior technical school.

In this the board of management has had the co-operation and assistance of the principals of technical schools in Melbourne, particularly at Caulfield.

Entries have closed and there has been an encouraging response from boys who are eager to ac-

cept engineering as a career. The course covers four years and £50 will be paid each successive year to the selected student.

It has been recognised for a long time that while there are many employers who deplore the dearth of expert and well-trained technicians and artisans, there are not many industrialists who are prepared to help to provide a pool of such craftsmen that would be of immeasurable benefit to the Australian industrial field.

So it is with a good deal of satisfaction that there has been at least this move toward that objective. It might serve as an inspiration and encouragement to wider and more concentrated efforts to give industry yet another drop in the reservoir of skilled and useful tradesmen.

### AUSTRALIAN TRADE FAIR SUGGESTED.

Mr. Neil Hopkins, chairman of the Export Development Group, recently suggested to the South Australian Chamber of Manufactures, that an international trade fair should be held within the Commonwealth. Expressing himself as "profoundly impressed" by the British Industries Fair and the International Trade Fair at Chicago, Mr. Neil declared: "Trade organisations in Australia could stage an excellent exhibition which would attract buyers and tourists from the whole world. It should be an Australian-wide exhibition, rotating between the capitals."

The suggestion has everything to recommend it. Why not some such move as part of the 50th anniversary celebrations of the foundation of the Commonwealth?

### MANUFACTURING BUSINESS FOR SALE

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Manufactured in brass and steel—  
finished in gilt or nickel.  
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from in a big variety of sizes.

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Two patterns, side lock and top  
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**WRIST BAND BUCKLES**  
Manufactured in steel and brass  
in a number of patterns supplied  
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**GRINDERY HARDWARE**  
Complete range of harness  
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If you have difficulty in obtaining any of the above supplies contact H. ARENDSEN & SONS PTY. LTD. or any of the above agents who will advise you of the nearest distributor or wholesaler.

FACTORY AND OFFICES SITUATED AT 1305 MALVERN ROAD, MALVERN, S.E.4, VICTORIA.

Our editorial representative in each State makes regular calls on manufacturers, but if YOU wish to see some particular phase of your business given publicity, communicate immediately with the Editor, and he will arrange for a representative to call.



# Around & About the FACTORY

## Tapping Attachment has Good Features

### "Jay-Dec" High Speed Unit

The "Jay Dec" tapping attachment, claimed to be a revolutionary advancement in engineering practice, is a tool which should have more than usual appeal.

It is the outcome of a series of exhaustive tests for more than three years and, having reached the stage of what its manufacturers consider is the peak of perfection, is now on the market.

It has further claims of being the answer to the tapping problem.

Each unit incorporates a range of tapping sizes that should com-

said to be the only movement necessary. The unit is equipped with a Master Collet, and adaptors for any make of tap can be supplied.

Centring the unit gives it rigidity from drive to tap centre, and this rigidity remains even at high speed, contributing to its efficiency. It is impossible, it is claimed, for lateral displacement to occur. The body is of high grade steel while all working parts are precision machined, specially hardened and ground.

The attachment has a wide working range and can be used with all types of machines equipped with reversible motion. It can be used for horizontal or vertical tapping, both for right and left-hand threads and in

blind or through holes. It is well suited for stud driving.

The "Jay-Dec" incorporates an ingenious "index station", used to indicate appropriate tap-driving pressures. Overloading, the makers say, is impossible, and the unit is fitted with a permanent stop to safeguard the attachment and the job as well—from possible danger. There are no springs. Power is generated by a resiliently displaced material and energy is stored and released without appreciable fatigue.

Maintenance is claimed to be simple. It constitutes recharging with lubricant every three months and no tools are required for this simple process. It is also said that the unit possesses lasting qualities that should carry with it a strong appeal to engineers and other users.

The "Jay-Dec" is manufactured by John S. Thompson (Industries) Ltd., Greenock, Scotland, and the agent for the factory in Australia is Norman N. MacLeod, 123-5 William Street, Melbourne.

ing out perfectly toasted sandwiches, savouries or sweets in the simplest fashion. It may be used with any type of heat whatever: whether gas, fuel, electric or pressure stove—or out in the open at picnics. The "Toaster" is fitted with extra long handles, so that it may be held with perfect safety over a wood fire.

Another Ess-Goods line, the "Wonder" hose coupling, is a new idea for the quick repair and easy joining of garden hose lengths. Made of rustproof metal, it consists of two rings and a tapered spiral tube screw fitting. The simple operation of joining two lengths of hose, without tools, takes only a few moments.

For hose couplings, curtain rod spear-ends, robe hooks, turn-buttons and pressure toasters, the Ess-Goods output is handled in all States by Johnson & Gaston Pty. Ltd. For toy wheels, Johnson & Gaston are the representatives in Queensland and W.A.; Ess-Goods themselves handle S.A.; P. W. Fowler handles N.S.W.; and Bruce Hubble handles Victoria. In the case of wing-nuts, Johnson & Gaston are the representatives for Victoria and Tasmania, while in the remainder of the Commonwealth, distribution is looked after by Stanfield Smith, Divett Street, Port Adelaide.

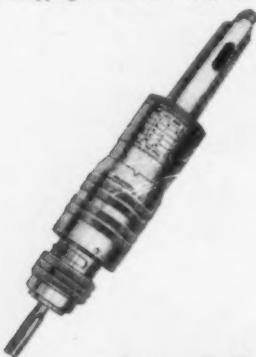
### Automatic Lubricators

#### N.S.W. Distribution by Manufacturer's Equipment Company

Equipment in these days is so costly, so complex, and so difficult to procure that the maximum of skill and attention are devoted to its maintenance, special efforts being expended to ensure that it is free from dirt and grit, that it is aligned correctly, and, perhaps most important of all, that it is lubricated effectively.

Recent years have seen the placing of increasing emphasis on lubrication, lubrication that is thorough, dependable, and free from the risks and inaccuracies inevitably associated with manual operation.

The "Toaster" is a latest speciality by Ess-Goods, is an excellent pressure toaster for turn-



Speed, combined with simplicity, is a feature of this tapping attachment.

mend itself strongly. Particularly designed for use with standard hand taps, the "Jay Dec" is a streamlined precision tool and with the added advantage that the operator has an unobstructed view of the tap when centring and when in operation. Care has been taken in its design to eliminate external projections, so reducing to a minimum the possibility of accident to the job in hand or the operator himself.

Speed, combined with simplicity, is another feature. The time of changing from one size to another has been clocked at five seconds. A flick of the hand is

## Useful Metal Products of Quality by "Ess-Goods," Beverley, S.A.

A metal goods manufacturing firm which has gained a reputation for quality as well as ingenuity in its useful range of lines is the business known simply as Ess-Goods, of Howard Road, Beverley, South Australia.

This is a partnership of two brothers, Tom and Arthur Sellick, who make that happy division of responsibility common in such cases wherein one—Tom—takes primary charge of the engineering side and the other—Arthur—of the business side. Their brand name is a modest masking of the initial letter of their surname.

A basic line from this factory and one for which Ess-Goods have long enjoyed a good name is a wide range of toy wheels, from six-inch rubber-tyred wheels down to the tiny 1 in. diameter die-cast type. One recent popular application of their wheels has been on clothes-basket carriers.

Then there are several lines which enter into that well-known modern industrial category of

the human factor.

The modern trend, in other words, is distinctly towards the automatic lubricator, the lubricator which is designed and engineered to operate independently of

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FULL PARTICULARS supplied on request

An interesting example of this type of mechanism is the "Tecalemit Brentford" mechanical lubricator, which has been so designed that it ensures an adequate and fresh supply of lubricant under pressure to every bearing and to every working part at pre-determined regular intervals. The human element and the disadvantages of gravity feeds are thereby entirely eliminated.

This "Tecalemit Brentford" mechanical lubricator is available in designs to suit individual machines. Its installation is an insurance against breakdowns, frequent overhauls, expensive hold-ups, and high maintenance costs.

Another important apparatus is the "Tecalemit" radial mechanical lubricating pump. This scientifically designed unit guarantees that the correct quantity of fresh grease is supplied to from one to twenty points at predetermined intervals. The system is completely automatic, the pump normally being operated from a rotating member of the machine. This radial lubricating pump is suitable for use on a wide diversity of installations, including centrifugal pumps, stone crushers, rolling mills, overhead

cranes, mixing plants, escalators, and kindred equipment.

The New South Wales distributors for the apparatus herein briefly described are Manufacturer's Equipment Company (a Division of Westcott, Hazel and Co. Ltd.), 280 Castlereagh Street,

An efficient, easily-operated sprayer is an indispensable item in the factory, the garden, and the home. In each of these places it is called upon to do a multiplicity of jobs—from the spraying of colours, the spraying of springs, the cleaning of engines, the spraying of plants, to the injection of bore liquids.

In order that these varying jobs may be executed with thoroughness and efficiency, a sprayer must be specialised in design, strong in construction, and readily adaptable to the different jobs and circumstances with which it will be called upon to cope.

Sydney, who invite interested industrialists to contact them for detailed information regarding the wide range of manual and mechanical, air and electrically operated semi- and full-automatic "Tecalemit" lubricating systems.

(1) The gun is constructed of non-ferrous metals.

(2) It is easy to clean, this being done by simply pumping through the gun water or cleaning fluid.

(3) The pressure is positive.

(4) Multi-directional nozzle sprays in all directions.

(5) Finely atomised "mist" covers all the surface.

The "Zefa" sprayer has a variety of operations in the factory, the workshop, and the garage. For example, it can be used for engine cleaning; for loosening rusted parts; for spraying springs, inks, commercial colours, and stencils; and for deodorant spraying. It does all these jobs with a high measure of efficiency because direct positive pressure forces the fluid into crevices, springs, etc. By removing the atomiser, moreover, a fine straight jet of oil can be ejected with considerable pressure.

The "Zefa" is not only simple in operation; it is also easy to clean. This is done by the mere pumping of water or fluid through the gun.

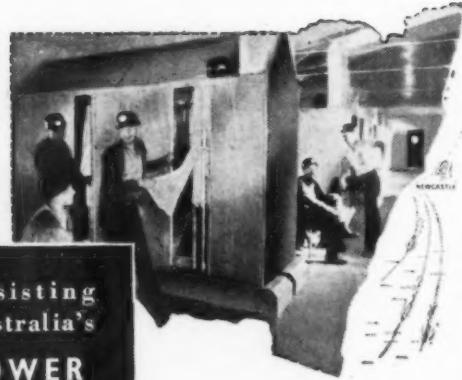
Of special significance is the fact that this sprayer can be converted readily into an efficient in-

## "Zefa" All-Purpose Sprayer Manufactured by Sydney Firm

Each of these essential features is incorporated in the "Zefa" all-purpose spray manufactured by Perfex Pty. Ltd., 120 Pacific Highway, North Sydney, New South Wales. This sprayer is of positive action—not air pressure.

Main interest centres on the fact that it requires only one hand for its operation, which is effected by easy trigger pressure. This means that the other hand is free to move the object being sprayed as to ensure that every part will be treated adequately.

The "Zefa" possesses the following important advantages:



Assisting  
Australia's  
**POWER**  
**LIGHT**  
and **HEAT**

Here is a typical example of how the Brownbuilt Sydney Plant assists the national needs of the Coal Board by supplying many large installations of Lockers for the mines. The dirty, wet clothes of miners coming off shifts are put into Lockers heated with steam ducts and they are dry by the time they come on the next shift. A compartment is also provided for each miner's other clothes and personal effects. In all spheres of industry Brownbuilt installations are found as behind-the-scenes essentials which assist management to higher levels of personnel efficiency and production control. Although steel shortages and national needs preclude short-term deliveries in most lines, the interests of customers are protected by steel importations and by constantly increasing facilities at Brownbuilt Plants.

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Representatives in all other States.

strument for the injection of hot or liquids. This is done by attaching the special injector which is supplied by the makers at a slight extra cost.

It is claimed for the "Zefa" that it is the only sprayer with (1) detachable glass jar; (2) one hand operation; (3) multiple direction nozzle; and (4) multi-purpose functions.

The solidity of the "Zefa" sprayer, allied to the fact that it is constructed of non-ferrous metals, ensures high operating efficiency and low maintenance costs.

## Electro-Rail is New Power-Tap Device

### Unit Saves Industry New Electrical Installations

The electro-rail is a new device which is of considerable value to many types of factories. It is a prefabricated electrical installation, made in 10-ft. lengths. Each length has two brackets, with screw connections. Any number of lengths can be erected and joined up until the full capacity of the rail has been reached.

A factory worker using a power-operated machine can then plug in throughout the entire length of the rail at any number of points.

The rail has a 60 and 100 amp. capacity, and the take-off points or fixed plugs a 5 and 10 amp. capacity.

A trolley can travel the entire length of the electro-rail, picking up the current as it travels.

The device is applicable to any moving appliances, such as hoists, cranes, or conveyor belts. Clothing manufacturers particularly will find it worthy of their attention. It has big advantages in factories where there are numerous sewing machines, for the motors can be plugged in conveniently anywhere along the line of the electro-rail.

The rail is light in weight and rigid. The 10-ft. length weighs 8-lb. Because of this lightness and ease in handling, one man can do the whole installation for a factory. Once the rail is put up, it does not require any more electrical installation, because anywhere the operator plugs in he can tap the power supply. It is equally simple to shift a machine. All that has to be done is to take the plug off the rail and put it at the new location. Factories can thus save a considerable amount of expenditure by avoiding new electrical installations.

Any changes in factory lay-out can be done immediately and free of cost.

The makers of the electro-rail are Gemco Pty. Ltd., 76 Bay Street, Ultimo, Sydney. The distributing agents are Jacoby Mitchell and Co. Pty. Ltd., 477-481 Kent Street, Sydney. Gemco claims to be the first firm in the British Empire to make the rail, which has been accepted by the Australian Standards' Association. The agents say it can be installed anywhere in Australia, with fairly prompt delivery.

overhead



vertical



around corners



underwater



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welds in all positions

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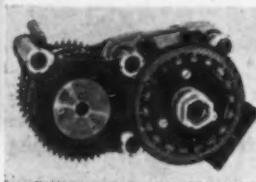
## Autoselector Mechanism Has Remote Control

The new automatic turning and selecting mechanism, illustrated, is used to turn shafts repeatedly to pre-set positions with speed and accuracy. Automatic electrical remote control is employed, and the setting accuracy is stated to be such that the positions selected never differ by more than  $\pm 0.050$  deg. from those which have been pre-set in the mechanism. This accuracy remains constant with different operators, speeds of

at present available. These are similar in design but are of different capacities. The small type, SZT.101, which can transmit a maximum torque of 2.4 lb.-in., is intended for small apparatus, and it can stop a shaft in any one of 12 pre-set positions. The large type, SZT.102, shown in the accompanying illustration, will transmit a maximum torque of 12 lb.-in., and the shaft can be stopped in any one of 11 pre-set positions. In addition, facilities are provided on this unit for manual adjustment of the controlled spindle. It is stated that autoselectors capable of transmitting

a maximum torque of 80 lb.-in. will be available in the near future. The diameter of the dial on the type SZT.102 unit is 23-in.

The pre-set positions can be chosen at will and may be changed at any time, and combinations of autoselectors may be driven by small electric motors. In such arrangements, after a new position has been selected remotely, the motor rotates the autoselector combination until the controlled spindles have, one by one, reached the positions required, whereupon the motor is automatically switched off. On account of their small size and the fact that their application does not necessitate any change of internal design, these autoselectors can readily be incorporated in many existing types of equipment. [2802].



Autoselector for setting shafts automatically to any one of 11 pre-determined positions.

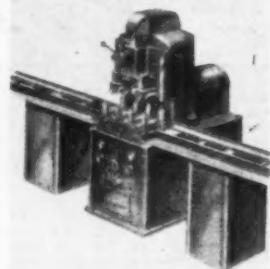
operation, or other varying conditions.

These new mechanisms have a wide field of application both in radio engineering and in industry. For example, they enable the frequencies of radio transmitters and receivers to be speedily and accurately selected, and in industry they may be usefully employed where extremely accurate machine tool operations must be frequently repeated, for example, on lathes and grinding machines. The speed of operation of a series of autoselectors is such that, using small transmitters, the system reaches the required setting within 2 seconds of the operation of the selector switch. Using large transmitters, the setting time is less than 10 seconds.

Two types of autoselectors are

the use of a lower marking roll. The rolls can be readily changed when an alteration of the identifying symbol is required, and denomination, knurl-type, rolls, with interchangeable type or dies can be supplied.

The loading height of the machine is 2 ft. 9 in. and feed and discharge conveyors, extending



Bar and tube machine for identification marking.

## Bar and Tube Marking Machine

Shown in the accompanying illustration is a bar and tube marking machine recently developed, to provide a rapid means of making identifying markings along the lengths of round, square, hexagonal, and other types of bars and on tubes and structural or extruded sections. It has a capacity ranging from 1 in. to 31-in. diameter, or equivalent, for solid sections, and up to 6-in. square for tubular and fabricated sections.

The material passes between a pair of air-loaded feed rolls and a centre marking roll carried on the vertically moving head, and a set of driven support rolls on the machine base. The entire head is lowered to the work pneumatically, air being admitted to the cylinder through a foot operated valve. The pneumatic system operates on a supply line pressure of 75 to 150 lb. per square in., and a hand-operated reducing valve is provided so that

the pressure on the marking rolls can be varied to suit the depth of indentation required. The vertical position of the feed and marking rolls can be adjusted to suit the thickness of the material, by means of a star-wheel on the front of the slide, while four pairs of vertical rollers, each provided with a turnbuckle adjusting screw, are fitted to centralize and guide the work transversely.

Drive to the machine is by a 3 h.p. motor through a variable speed unit, which provides for a maximum bar speed of 220 ft. per minute. Speed control is by a handwheel at the front of the machine base, and reversing push-buttons are provided for the motor, so that the work can be fed from either end of the machine.

The 3½ in. diameter marking and feed rolls enable work to be marked continuously or at determined intervals up to approximately 10-in. pitch, and work can be marked on opposite sides by

from 10 to 16 ft. on either side of the machine can be supplied. The floor space occupied by the machine is 2 ft. 8 in. by 4 ft. 3 in. [2583].

## Soluble Cutting Oils for Drilling

A report recently issued gives the results of tests made to compare the performance of eleven well-known soluble cutting oils at both the makers' recommended dilutions and a dilution of 1:25.

The drills used in the tests were specially made to ensure uniformity of material and shape, and drill point grinding was car-

(Turn to page 24.)

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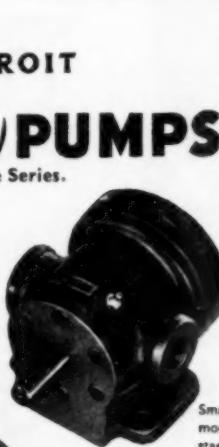
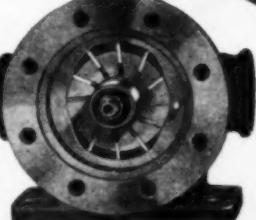
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## THE "RC-65"

**It compounds! It extrudes! It colours!  
It reclaims scrap!**

The new RC-65 Twin Screw Extruder is one further step in the range of R. H. Windsor's plastics extrusion equipment. This new unit has 3.5in. worms and a capacity of 65 pounds an hour.

The RC-65 is designed to give perfect mixing, plasticizing, compounding, colouring and pelletizing. Also, operating costs are low, as are the power costs! Mono-filaments from .010in. to tubes, strips and specially extruded sections 10in. in diameter can be handled by this unit, which has been built to American standards of performance.

Soon available will be the RC-100 Twin Screw Extruder with 4.3in. worms, and a capacity of 100 lbs. per hour, to be followed by the RC-200 Triple Screw Extruder having 4.7in. worms and 200 pounds per hour capacity.

*Details available from*

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## ROPE MAKERS—THIS IS FOR YOU



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N.S.W. H. G. THORNTON & CO.

ried out on a drill grinder modified to provide the necessary accuracy.

Drilling tests were conducted with each cutting oil using a rectangular frame drilling machine, and the workpieces were clamped to the table of an electrical dynamometer.

The following steels were drilled using each oil: carbon case-hardening steel En 32A, "55" carbon 0.75 per cent, nickel steel, En 10, heat-treated to 55 tons per sq. in., and 4.25 per cent, nickel-chromium-molybdenum steel, En 30B.

Four drill life tests were made with two emulsions of each oil, using drills taken at random from a group of nine. Test procedure consisted of drilling holes to a depth of 11in. until the drill failed, drill life being expressed as the number of holes drilled before

failure. Four gallons of fluid per minute were supplied through a circular distributor.

None of the soluble oils gave a consistently good performance on all the steels. Four soluble oils at various dilutions were superior to the others when drilling steel En 32A. Four oils at a dilution of 1:25, one at a dilution of 1:20, and one at a dilution of 1:35, gave the best results on steel En 10. Five oils at different dilutions were clearly superior to the remainder when drilling steel En 30B.

Charts in the report show the order of performance of the oils based on average drill life, and photographs show typical flank wear on drills used for steels En 32A, En 10, and En 30B, and typical build-up on the lands of drills which had been used on steel En 10. [2572].

## Down Time and Its Causes Recorded

A new device for recording of machine operation which can give mill men a minute-to-minute diagrammatical picture of mill operations is in production, which device is applicable to most types of textile machines, continuously and automatically records on a central recording apparatus all running and stopping times of the machine under supervision. It goes a step further by recording the particular reason for all stoppages.

Stoppages of the machine are recorded by electrical contacts and automatically transmitted by connecting wiring to a continuously moving chart in the recording unit. The running time of the machine is represented as a black line on the graph, which

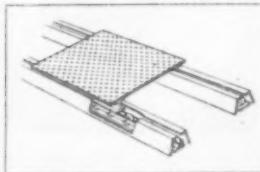
has an hour scale and shows the number of each machine. Stoppages are shown as blank spaces or breaks in the running-time line. A telephone-type dial mounted on each machine permits operators, by dialling a single digit automatically to record a code number against the blank space in the diagram on the recorder to denote the reason for the stoppage.

Use of the device permits mill operators to keep a close check on the results of various changes which have been made—changes in humidity, sizes, etc. Analysis of the chart also tells the major reasons for stoppages and permits mill operators to take corrective steps to reduce the most frequently occurring stoppage causes. [2607].

## Roll-Race Conveyor Requires Less Power

Operating on the same principle as a roller bearing, the roll-race conveyor, illustrated, comprises a load-carrying belt or slat system running upon a series of rollers, in such a way that each slat is at any time running over at least six rollers. Belt or slat member may be power-driven.

The rollers are from 1½ in. to 3 in. diameter and are linked together by flexible connecting members, so that installations can be designed for going round 90 deg. or 180 deg. corners or as endless belts. The dead load on the platform is transferred directly through the rollers to the bed or track, which may be set flush with the floor, and there is no load on the pins of rollers. The load capacity of the conveyor is therefore governed by the crushing strength of the rollers.



Claimed to be from five to twelve times as efficient as the normal type of heavy-duty conveyor, this conveyor features a free-running roller chain which carries the load platform.

It is claimed that this type of conveyor will operate with one-fifth to one-twelfth of the power required for the normal heavy-duty conveyor, or else operate with the same power over five to twelve times the length or with the same ratios of increased load.

When the conveyor is designed as an endless belt, and load bearing on the return, the universally jointed roller chains are taken outside the belt at the end of the span and brought in under the belt for the return. In this way the slats can be kept horizontal during the complete circuit.

The conveyor can be designed to obtain a local increase or decrease in speed, the slats being independent of each other and the roller chains driven.

Life of the load-carrying member is considerably increased in this form of conveyor, as the tension in the belt or slats is reduced in proportion to the power required to drive the unit. [2629].

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\* Examples—on  $\frac{1}{8}$  in. Whit. M/c Tap total tolerance (maximum-minimum size on effective diameter) is .0016 in.; on  $\frac{1}{16}$  in. Whit., .0020 in.; on  $\frac{1}{32}$  in. Whit., .0023 in.

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**Megohm Meter  
Maintains Constant  
Source Voltage**

The new megohm meter, illustrated, features an internal circuit designed to assure the user that the applied voltage is equal to the specified voltage as long as the resistance of the piece under test is within the range of the meter. Resistance tests may be conducted with a known voltage.

Two models are available in this meter. One contains an internal 500 v. measuring source, together with a 200 v. source. The



Two models of this new megohm meter are being produced.

other model is equipped with a continuously variable measuring source ranging from 100 to 600 v. d.c. A volt meter is provided for checking actual voltage being applied to test. This second unit is designed to test for resistance changes as the voltage is varied.

The manufacturer intends these meters for production as well as laboratory work. Inclined control panels with specially designed meters and control markings are claimed to facilitate accurate, rapid readings. Two models similar to those listed above are available for applications which require a single constant-voltage test current. Within a given outside current resistance range, these instruments will compensate for external changes and hold the output voltage constant. [2827].

**Fine Wire Produced  
Electrochemically**

A new method of making fine wire has been developed by which scientists have produced 0.00015-in.-diameter wire in the laboratory. The process consists of passing wire through a chemical bath in which an electric current is flowing. The wire acts as an electrode, the surface being polished away and the metal dissolved until the desired size is obtained. One application of such fine wire may be in the production of smaller, more compact electronic equipment. [2870].

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Further lists being prepared.

Details of any item on application.

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**High-Frequency  
Concrete Vibrator**

Applied electro-magnetics has solved a fundamental problem in concrete technology. The increasing use of pre-cast concrete for mass-produced housing components, etc., depends on efficiently consolidating by vibration a harsh mass of cement containing little water.

Research has shown that the best results are obtained from vibrating mixes of this type at 6,000 cycles a minute. Mechanical equipment for the purpose has suffered from certain defects: belts, cams, motors and other parts of rotary equipment are liable to cause difficulty and even to breakdown. Furthermore, maintenance costs are high.

Non-rotary, low-maintenance vibration equipment has been evolved, after much research and design development, which is based on the application of electro-magnetic waves. Various different models exist (e.g. for manual, and experimental use) but the basic underlying principles of them all can be understood from the industrial version.

A table 10 ft. square (3m. by 3m.) floats on heavy steel springs. The latter are especially constructed to react in resonance with impulses from powerful electro-magnets. When a suitably adjusted current is applied to the magnets, the springs open and close, thus imparting 6,000 vibrations per minute to the table they support.

The load to be treated is placed on the table, and the mould rigidly clamped on to it. Current is turned on, consolidation occurs.

It is stated that this method simplifies production by lessening shrinkage in curing, and facilitating mould stripping; the end product shows superior resistance to cold and weather, among other advantages. (2533).

**Testing Ball Bearing  
Lubricants at Low  
Temperature**

A compact, semi-portable device for low-temperature testing of ball bearing lubricants has been developed. In this connection it is pointed out that lubricants for ball bearings in such equipment as aircraft gun turrets must remain effective at temperatures down to 65 deg. below zero.

The device comprises an inner and an outer chamber, between which dry ice is placed. For testing, a ball bearing is placed on a spindle in the inner bucket and rotated by a small motor.

The tendency of the outer race of the ball bearing to move with the inner race is measured by a strain gauge. If a lubricant under test thickens in the cold atmosphere, the inner ring will turn less freely and the gauge will register a greater strain in the outer ring. (2573).

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Comfortable executive offices and a well-planned factory area lie behind this attractive frontage in Princes Highway, Arncliffe, N.S.W.

## Custom Moulding In Plastics

### N.S.W. Company Demonstrate Their Capacity in This Field

In analysing the "success story" of any manufacturing organisation of consequence, it is usually possible at the outset to seize on some phase of the company's production and say with certainty that therein lies the secret of their advantage over competitors. It cannot be denied that some such pronounced feature must exist in the policy of a manufacturing company that is to last and prosper.

THE unprecedented demand for consumer goods in recent years has bought in its train newly-conceived manufacturing organisations that have expanded in size and in output to a remarkable degree in a short space of time. What remains to be proven is the ability of many of them to face harder times and keener competition. Those likely to survive when the going becomes rugged are not necessarily with the largest build-

ings or the greatest number of employees. They are more likely to be those who made long-range plans, whose structure is based on a broad foundation of skill and service to the consumer.

It is upon such farsighted industries that Australia's greatness as a productive nation rests, and on whom the Commonwealth will depend for continued prosperity.

It is a keen pleasure for us, while observing the flow of Aus-

tralian production, to single out an organisation with those admirable qualities, to learn what we can of their contribution to the fabric of our national life, and to tell their story in the "Manufacturer".

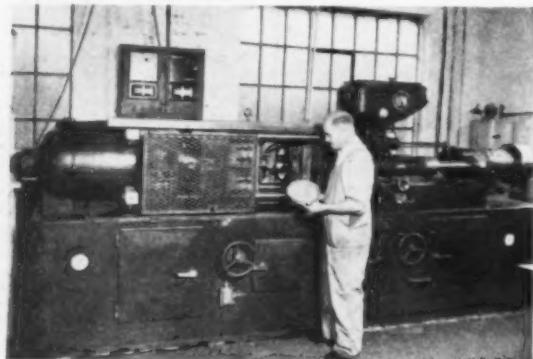
The photographs reproduced on these pages were taken at the premises of Commonwealth Moulding Pty. Ltd., at 242-246 Princes Highway, Arncliffe, N.S.W., where we witnessed the production of a considerable range of plastic products and learned of their ability and capacity in the important field of custom moulding.

Commonwealth Moulding Pty. Ltd., like many other modern companies, has a history of rapid expansion. It became apparent to us during the early stages of our visit, however, that these custom moulders have not outgrown their staying power and have a bright, alert eye on the future.

This progressive company has two channels of output. They manufacture an extensive range of items, mostly designed and developed by themselves, and they have considerable capacity for expert custom moulding of plastics. Their regular products include



This well-equipped toolroom, a prominent feature in the home of "Marquis" plastics, serves the company well in their production of custom mouldings for Australian industry.



This 9 oz. injection moulding machine is among the modern, efficient plant operated by Commonwealth Moulding Pty. Ltd. for the production of "Marquis" plastics.



The 8 lb. cabinet for the Kriesler radiogram as it comes from the press. Commonwealth Moulding Pty. Ltd. describe this as "one of the largest compression mouldings of its kind in Australia."

radio and electrical components (among them an outstanding wire-wound potentiometer), industrial hardware, builders' hardware, refrigerator equipment such as collars and lids, table and kitchen-ware, toys and fancy goods.

All of these products are marketed under the trade name of "Marquis" a name well and favourably known to Australian industry, signifying as it does a range of reliable plastic mouldings.

It is a range of which any plastic moulder could be proud and satisfied. Commonwealth Mouldings Pty. Ltd. are proud of these manufactures, but they are not satisfied to coast along on the popularity they enjoy. They are secondary, they insist, to the custom moulding service which has been carefully built up along sound lines over the years and which is proving of extreme value to other fields of Australian manufacture.

This modern, 40,000 sq.ft. factory is entirely self-contained. Planning, die making, heat treatment, production and packing and despatch sections have been kept fully balanced throughout the expansion which has taken place since the company's formation in 1933.

Mr. T. K. Stewart, recently appointed general manager of the company, explained this at the outset and made a point of the fact that with the continued growth of the organisation care would be taken to retain the production set-up which ensured maximum service in custom moulding.

This had been the backbone of the company's contribution to the



Buffing the trimmed and carefully checked cabinets before delivery to the radio manufacturer. At left can be seen a cabinet with lid in place.

fabric of Australian industry and would continue as its main feature.

During our subsequent tour of the factory under the guidance of sales manager, Mr. K. Bridie, we were able to witness just what is being done along these lines at the present time.

An example of the quality of this firm's custom moulding was found in a current production—cabinets and cabinet covers for the well-known Kriesler "3-in-one" radiogram. To get the true picture of this achievement it was necessary to visit the scene of earlier stages of production, the company's toolroom where precision dies for such manufacturers are constructed.

This phase of the company's activities we found really surprising. It is not unusual to find efficient toolrooms in factories of this type. What was surprising was finding the die production department occupying such a large proportion of the total factory area, so well staffed, and working in such close co-operation with

the planning office. It bears out, of course, the company's claim that precision custom moulding is, and will remain, their major aim and constant pre-occupation.

We illustrate this spacious and well-equipped toolroom. What we cannot illustrate is the scrupulous care that goes into every stage of the production of a die by Commonwealth Mouldings Pty. Ltd. However, this is most evident in the finish and precise accuracy of the final product, qualities which are retained throughout the entire run.

While it so happens that the dies for this job were not produced in this toolroom, the planning of them was done by Commonwealth Moulding experts, and, of course, the actual making of the die would have been easily within the capacity of this firm.

The cabinet of the Kriesler radiogram, Mr. Bridie claimed, is the largest compression moulding of its kind in Australia, and in its dimensions gives an indication



The lid for the Kriesler radiogram weighs 8 lbs. and is produced with the same attention to quality as that afforded the cabinet moulding.

of the company's capabilities in this field.

This 8 lb. phenolic moulding is produced in a 500 ton press at an actual operating pressure of 3,000 lb. p.s.i. Cored and steam heated with twin trap control, the die size is 31" x 38" x 3". Moulding measurements are 20" x 20" x 12", to produce a cabinet the actual size of which is 19" x 19" x 10".

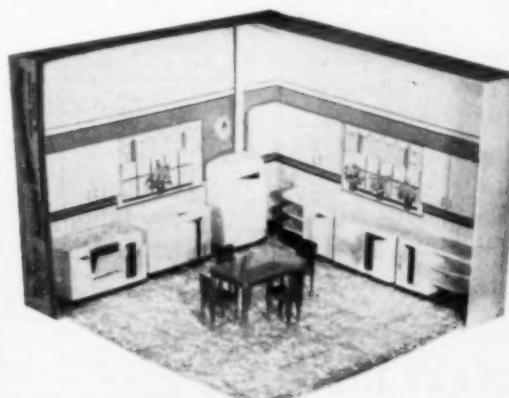
In this job, "Ellitane" specially formulated long-flow cabinet moulding material is used, coming to the press via two "Raytherm" preheaters, one 7.5KW and the other 3.5KW.

From the press the newly-moulded cabinets are worked through a series of four shrink fixtures before passing to another department for trimming.

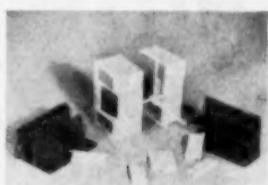
The matching cover for the cabinet, a 3 lb. compression moulding, is produced on a smaller press, and although of less complicated design, receives the same comprehensive care in production as that afforded the cabinet itself.

Our illustrations show stages of these productions and also the appearance of the assembled unit after flash removal and buffing, when it is ready for delivery to the radio manufacturer.

Of the very considerable range of toys produced by Commonwealth



A prominent "Marquis" product. The "Little Homemaker" toy kitchen set with "walls" in place, flooring laid, and the units set out in one of the many arrangements possible.



Component parts of two of the units for the "Little Homemaker" Set, before trimming and assembly. Shown are the sink and cooking stove moulding in white cellulose acetate, the hinged doors, and the blue base portions.



General manager Mr. T. K. Stewart, is carrying out the company's policy of service to industry.

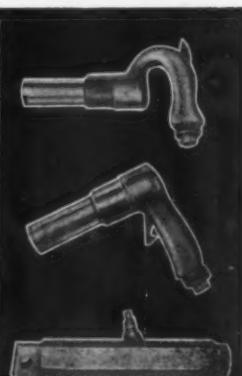
Used by some of the most modern and largest foundries in Australia, as well as hundreds of other concerns.

**"JAMEC"**  
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Moulding Pty. Ltd., undoubtedly the most interesting is the "Little Homemaker Set", which we illustrate.

It comprises a sink unit, a refrigerator, a stove, a cupboard, two servaries, a table and four chairs. The base and lid of the attractively designed box in which these pieces of miniature kitchen furniture are packed, are set up to form walls, as shown, and a square of stiff paper "linoleum" is unfolded to form the flooring.

Within this toy kitchen any number of arrangements of the pieces are possible. Doors are hinged and open and close freely, yet the pieces are strong enough to withstand rough handling. These features, and the fact that fine detail has been faithfully reproduced in these toys, are responsible for the immense popularity of the "Little Homemaker Set" amongst children of all ages.

The set is injection moulded in cellulose acetate and provides a good example of the careful design and skilful construction of dies for the maintenance of a high degree of accuracy over a long run, which is a feature of "Marquis" products.

The "Little Homemaker Set" was designed by Mr. J. Bird, chief designer for Commonwealth Moulding Pty. Ltd., and has been in steady production since 1948.

It consists of 27 moulded components, produced in nine dies. The chairs and table are an attractive shade of blue, as are the components which form the backs, bases and inner shelves of the units. Outer components are white. All are of course, washable.

The components from the nine dies are grouped as follows: set of 10 doors; servary (right and left); bases for servaries; refrigerator and cupboard; bases for refrigerator and cupboard; stove and sink; bases for stove and sink; four chairs; table. Considerable ingenuity was necessary in the design of these dies, for the accurate reproduction of detail of the full-size originals presented numerous problems.

One of our illustrations shows the sink and stove units as they came together from the press, before trimming of runners; base components for these units; and the doors which are fitted to them during assembly.

With the approach of the festive season the demand for these sets and for other "Marquis" products is increasing rapidly.

The demand for the custom moulding facilities offered by Commonwealth Moulding Pty. Ltd., is also booming. Not from reasons of seasonal requirements, though, but as a result of years of building up an enviable reputation for fine workmanship, of meeting, without fail, the endless demands of Australian industry.

The aim of Commonwealth Moulding Pty. Ltd., we are informed, will continue to be a steady expansion; a slow, sound growth that will be enduring and will make possible the continued service to industry in the important field of custom moulding which has inspired the activities of this organisation in the past.

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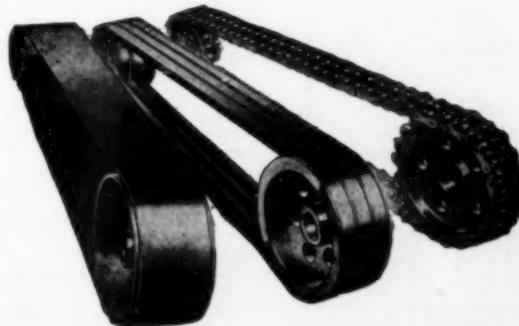
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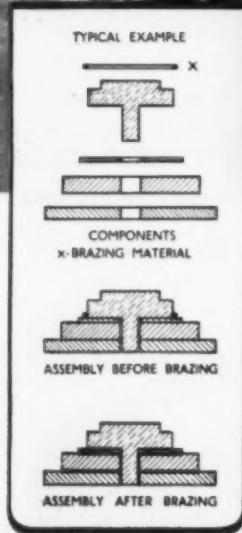
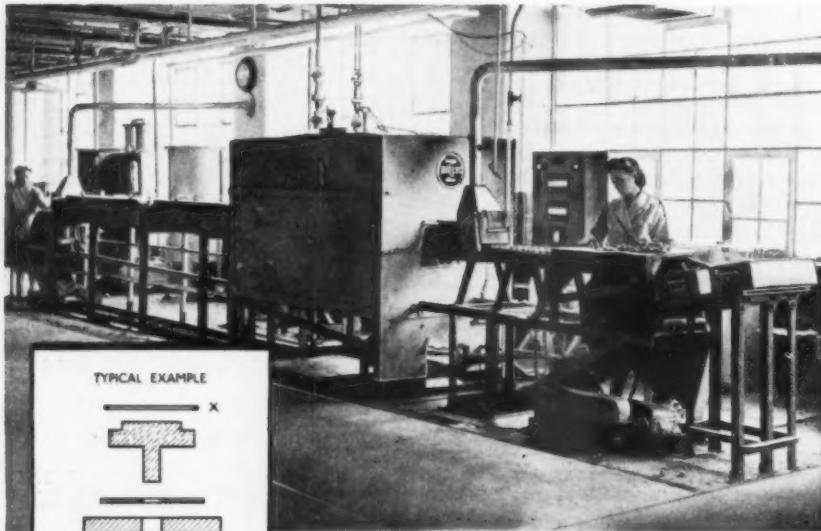
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(Continued from page 2.)

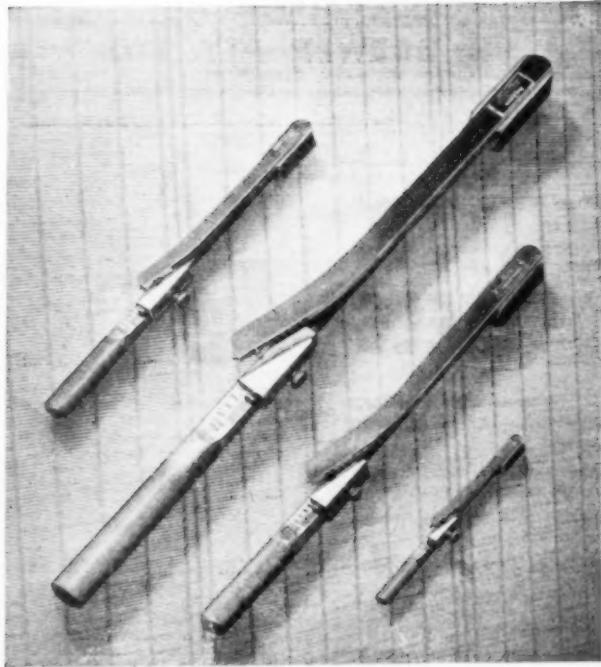
about. I did dream about. I began to look forward to the loyal toast. I have no recollection of the brand. It was probably a very good one. The Italians knew their grog, and so did the R.F.C. But it was all the same to me. I was like the office boy who has fallen in love with the principal girl in the pantomime. Afterwards, I came to associate creme de menthe with principal girls—and boys—and worse—but it will always remain in my memory as my first introduction to civilised drinking.

Of drinking in Italy in 1918, I can remember very little more. In the mess, the popular drink in the daytime was egg-nog. In the village pub it was Cinzano—I can't remember whether sweet or dry—sweet, I imagine. Few village pubs carried Scotch. They called it fire water, and looked on in admiration (or perhaps it was disgust) while the incredible British drank the stuff. Beer—or biere—was too weak to interest the British troops. One liqueur I remember—a sweet yellow thing called v o v—I think. I've asked many people since if they've met it, but nobody seems to have. Perhaps it was a local brew—or perhaps I've got the name wrong. I can't remember now whether it was "orangy" or what its flavour was.

The war over, I returned home—via Paris once more. This time, greatly palpitating, I went to the Folies Bergere. There I found an all-English company—fully clothed. (Every time I meet my old friend Jim Cornell, I think of the times I've wasted in Paris). Home in Scotland again with my people, my drinking came to a partial end. I occasionally forgot myself at the golf club, but it was not until I was 28 and on the way to Australia that my Bacchanalian career was resumed.

Meanwhile I had got in tow with a young English lady whose people—the army sort—knew how to drink properly. For 12 months before she joined me in Adelaide and took charge of all my affairs, including my drinking, I had the great pleasure of living in residence at St. Mark's College. The S.S. Cathay, coming out, had been joined at Colombo by the Rev. Julian Kenneth Faithful Bickersteth, B.D., and a gang of school boy cricketers, including a surprising number of young gentlemen whose names (I afterwards learned) were famous in the Australian world of grog. Seppelt, Goldfinch, Lee, etc. The Rev. Julian Kenneth Faithful very kindly steered me into St. Mark's College as music tutor, there being no musicians there to tute, at the time.

At that time, Cooper's was the proper ale to drink. I acquired a genuine regard for it and could find little pleasure in West End. Some 13 years later, when another great war forced me to spend 31 extremely comfortable but extremely dull years at Mallala, I



found the greatest difficulty in changing over to West End. I never knew why it was, but our mess never seemed to be able to get Cooper's, and I was reluctantly forced into becoming a regular customer of the West End Brewing Company. Now I find (damn it all) that I'm unhappy without my West End, while Cooper's arouses a nostalgic memory of my last year of bachelorhood and tends to put me prematurely to sleep.

I don't know why Cooper's make their beer so difficult to come by. From my own experience, I can't help wondering if they aren't making a big miscalculation in the psychological field.

As for the higher drinking—the kind that interests the Bacchus Club—I must confess that I am as much of an innocent abroad as ever. I realise now, of course, that there are other things than creme de menthe. I think I can tell the gentler, subtler European wines from their Australian namesakes, but I wouldn't like to bet even on that. It seems to me that, in wine as in music, the younger you start the better. After a certain age we tend to see "sermons in stones, books in the running brooks, and good in everything." I'm not sure that our keenest delights are not to be found in youthful prejudices that refuse to die—irrational—crazy—

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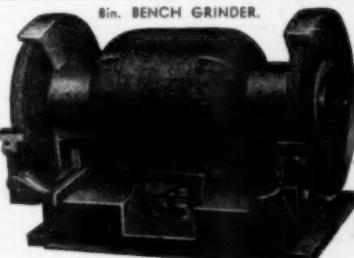
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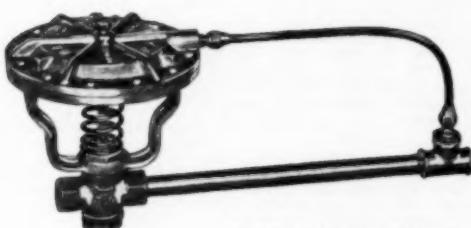
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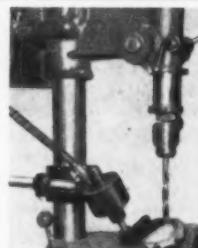
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**ALUMINIUM MONOSTEARE:** Firms manufacturing Aluminium Monosteare are asked to write to Ref. 8286, c/o "The Australasian Manufacturer."

### ELECTRICAL INDUSTRY PROTEST.

The Federal Council of the Electrical, Radio and Telephone Manufacturers of Australia recently sent the following letter to all members of the Australian Parliament:—

"Dear Sir,—The Electrical Industry views with concern and alarm the Federal Government intention to continue participation in the General Agreement on Trade and Tariffs implied by its decision to send a delegation of public servants to the Torquay Conference. This decision has been taken despite and notwithstanding very strong protests from all industries throughout the Commonwealth, including the electrical industry; it is, therefore, hoped that those responsible are fully aware of the long range effect which such a decision could have on vital secondary industries.

"It is strange that those now in Government should, when in Opposition, have condemned this agreement in no uncertain terms, and this volte face is most bewildering, as is also the fact that experienced industrialists are not to be included in the delegation.

"Conditions at the present time concern us little, but the position some years hence when conditions will be entirely different is our main problem. Unfair competition from countries on lower living standards may well force out of business many industries vital to the Commonwealth both in times of war and peace, and would result in probably mass unemployment and lowering of living standards.

"Extinction of some industries vital to the Commonwealth in time of war may be exactly what is desired by a certain section of the community more loyal to a foreign power than Australia.

"Government advisors state that escape and loophole clauses are included in the agreement which could be implemented should any industry find itself in difficulty by unfair competition. By the time the cumbersome machinery of State carried out the necessary investigations and took action, it may well be too late, as industries could not complain until hurt, and in the meantime, the country could be flooded with competitive overseas goods. Some industries cannot at present meet the demand for their products, but they have not objected to duty free

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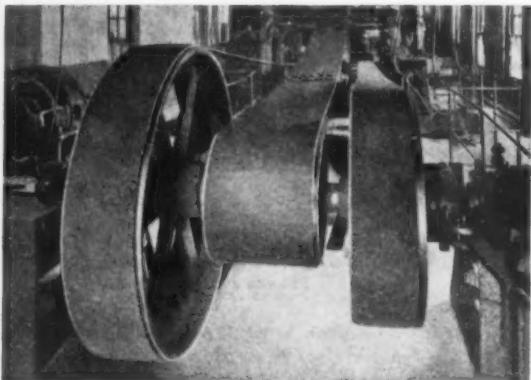
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entry of competitive goods to alleviate the position.

"Already we have experience of things to come in the electrical industry if tariffs generally are lowered. A certain State Department has already placed orders for equipment manufactured by a Company in former enemy territory, at prices including present rates of tariff, less than those for similar equipment manufactured in Australia. This overseas factory is reported to be the most modern of its kind in Europe. It was destroyed by Allied bombing during the war but has now been completely rebuilt with the aid of Marshall dollars. Its employees work 60 hours per week at approximately 65 per cent. of the wages of Australians.

"If the existing protective tariffs are lowered, how can Australian industry compete with such countries except by lowering of our standards of living and in-

creasing hours of work. Czechoslovakia has already made demands on Australia for tariff reductions on certain commodities. If we agree to such requests from the outlet of the 'Iron Curtain', then we assist, rather than resist the menace of Communism, and the Bill to limit the activities of Communists in Australia becomes a farce. Parliament has the final power to ratify or otherwise any concessions which the public service delegation makes at Torquay, therefore the continued development and defence of Australia depends entirely on Parliament's further action. Thus you will see that as an elected representative of the people, a heavy responsibility is yours to ensure that when the proposals made at Torquay are brought forward for ratification in the House, the full implications of each and every proposal is thoroughly studied in the light of the need to develop Australia's

industries and capacity for employment.

Yours faithfully,  
J. WILSON, President.

### AUSTRALIAN ALUMINIUM BY 1952.

The Minister for Supply, Mr. Beale, gave the satisfactory assurance in the House of Representatives at Canberra recently that by 1952 aluminium will be produced in Tasmania. "The Government," he added, "hopes to produce approximately 13,000 tons of aluminium ingots a year. This tonnage is about equal to Australia's present needs."

The materialisation of these Government hopes will mean big things for this country, for aluminium is absolutely indispensable to both peacetime and wartime production.

### INCREASE IN GENERATION OF ELECTRIC POWER.

Figures issued by the Commonwealth Statistician, Dr. Roland Wilson, show that the generation of electric power in Australia has doubled in 10 years. In 1938-39 Australian power stations generated 4,688 million kilowatt hours. In 1948-49 the figure was 9,035 million kilowatt hours.

Increases in the various States over the 10 years, in millions of kilowatt hours, were:—

	1938-9.	1948-9.
Victoria	1223	2504
N.S.W.	1948	3717
Queensland	387	890
South. Aust.	256	567
Tasmania	567	976
Western Aust.	307	399
Totals	4688	9053

Water power provides less than one-ninth of the total effective generating capacity of 2,000 million kilowatts.

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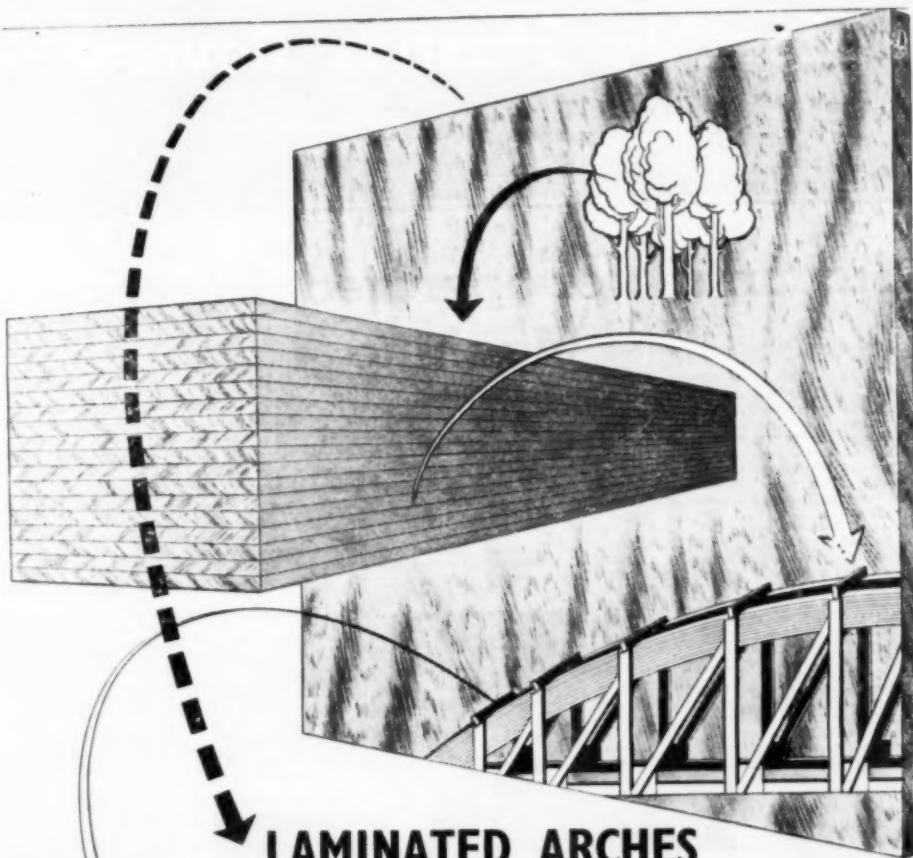
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# Monthly Plastics Review

A special section published monthly with the object of contributing to the progressive development of the Plastics Industry in Australia.

## Accumulator-operated Injection Machine

ONE large and successful custom moulder who has been a compression moulder for 30 years—and in the injection field practically since that method was first used, has disclosed for the first time the details of his special methods and machines used for injection moulding.

About 17 years ago, when this organization had but one plant, its board of directors decided to buy one of the small early-model injection machines. It was never even uncrated because the moulder's chief engineer had decided he could build a better machine for less money.

The project of building a better machine was not as simple as it first appeared. In fact, more than a year elapsed before even the smallest thermoplastic parts were accurately and satisfactorily produced—and then the first machine built by them was discarded and replaced by a stronger one. Even after 17 years, refine-

ments are still being incorporated in the company's special injection machines to increase capacity as well as over-all efficiency. To-day they have three plants; two of them have upwards of 40 of these injection machines, the larger ones having a proved top capacity of 200 ounces.

**TRANSFER-TYPE PRESSES.**  
Basically, says an article in "Modern Plastics", the machines

mould is a special sprue nozzle through which the moulding material is injected.

Each strain rod is equipped with a stop on which the bolster plate rests when the mould is in the open position. Heavy spiral pushback springs are assembled on each strain rod between the top of the bolster plate and the under side of the head of the press.

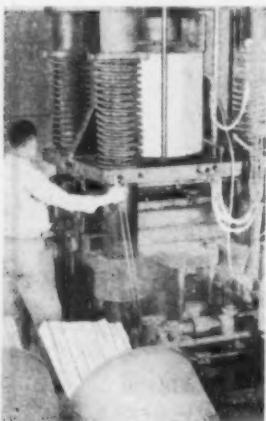
main ram then continued to descend, thus parting the mould halves.

The injection piston is permanently fixed on the under side of the head of the press; hence it comes out of the injection chamber as said chamber is forced down by the pushback springs. Moulding material is loaded into the injection chamber when the machine is in this open position.

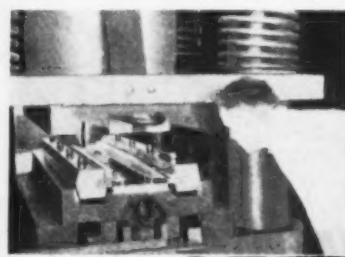
### MOULDING OPERATION.

The injection moulding operation with this type of equipment is accomplished as follows: With the injection chamber loaded with material, practically all of which is plasticized, hydraulic pressure is admitted to the main ram. As the ram moves upwards, the two halves of the mould meet and close. As the ram continues upward, it raises the assembly composed of the press bed and the lower half of the mould, the upper

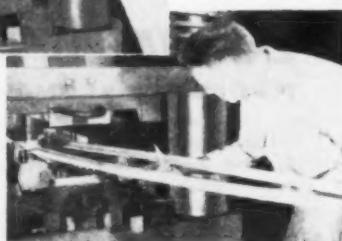
(Turn to page 42.)



With mould open, piston is out of the chamber. As operator pushes lever to first position, mould closes on low pressure.

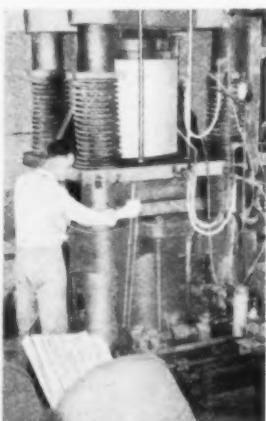


(Left): After injection cycle is completed, mould is opened. Movable side cores for moulding undercut slots in 54-in. long strips are raised so that strips can be removed from the mould.



are vertical, upward-acting, transfer-type presses, with special castings for the heads and pressure pots. A movable heated bolster plate is located between the movable press bed and head. The four corners of this plate are assembled to four bushings which are a sliding fit on the strain rods. The plate carries the upper half of the mould on its under side and the injection cylinder on the top. The lower half of the mould is mounted on the press bed. Connecting the injection chamber and top half of the

The set-up of the various components of the machine is as follows: When the main ram is in its fully lowered position, the two halves of the mould are parted, since the lower half of the mould is actuated by the main ram and also because the travel of the bolster plate carrying the upper half of the mould is controlled by the location of the stops on the strain rods. In other words, the pushback springs have forced the bolster plate to follow the downward travel of the main ram until the stops were encountered; the



Mould and chamber continue upward; piston presses on material; 5,000 p.s.i. is applied to main ram; injection is completed.

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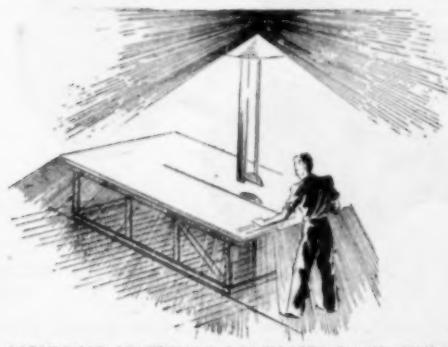
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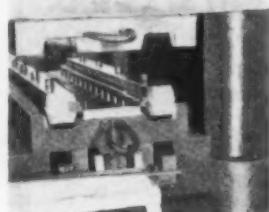
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(Continued from page 40.)  
half of the mould, the bolster plate, and the injection chamber. As these components continue upward, the fixed injection ram enters the injection chamber or cylinder. The entrance of the ram into the chamber creates pressure on the moulding ma-



Close-up shows B knock-out pins, intricate side cores for undercuts.

terial; as the upward movement continues, plasticized material is forced out of the bottom of the injection chamber through the sprue hole, along the runners, through the gates, and into the cavities of the clamped mould. Thus, one hydraulically operated ram accomplishes both clamping

of the mould as well as injection of the material involved.

All of these presses are equipped with hydraulic pushbacks, in addition to the spring pushbacks mentioned above. These hydraulic pushbacks serve to force the main ram downward when the mould is being opened. Thus there are two sets of pushbacks: spring to force the bolster plate downward to the stops, and hydraulic to force the main bed of the press down and open the mould.

When the first machine of this type was built 17 years ago, it was decided that it would be economical to operate the equipment from a central hydraulic power system. The plant at that time had available the standard pressures used for compression moulding—namely, about 600 p.s.i. for low pressure closing operations, and about 2,200 p.s.i. for the high pressure. Specifications of the first press for injection moulding were, therefore, designed around these two pressures. A great deal of time elapsed in futile attempts to produce good parts with these pressures. But because the main and only ram of this type of press accomplishes both clamping and injection, it was necessary to sacrifice either clamping pressure or injection pressure.

To illustrate the problem, consider a press equipped with a 10-in. ram and operating on 2,000 p.s.i. hydraulic pressure. This

rain would exert a total pressure of about 75 tons. With the mould closed and injection about to begin, these 75 tons would be exerted against the injection ram. Consider for the moment that this injection piston was the same diameter as the main ram of the press. That would mean that 75 tons would be exerted on the material in the pot. After the injection of the material had been completed, this same pressure (assuming that the material was all fluid) would be exerted on the material in the mould.

#### COMPARATIVE AREAS.

Now assume that the projected mould area of this mould was the same as the area of the injection piston; that is, that the areas of the clamping ram, the injection ram, and the mould are exactly equal. Under these conditions—and again assuming that the material is completely fluid—the assembly composed of the upper half of the mould, the bolster plate, and the injection cylinder would be practically floating. Under these conditions the mould would probably open and flashing would occur. In order to overcome this condition it would be necessary to either (1) reduce the number of cavities in the mould, thereby cutting down the projected moulding area, or (2) increase the diameter of the injection chamber thereby increasing the clamping pressure on the mould. If this latter course were followed, however, the injection pressure on the moulding material would be reduced. With any reasonable size mould the machine designer was faced with the necessity of increasing the diameter of the injection chamber beyond the point where sufficient pressure could be obtained to properly injection mould most thermoplastic materials.

The article points out that while it is true that the full pressure on the material in the injection chamber is not fully transferred to the material in the mould, the above example is cited merely to illustrate the clamping problem. At the time this work was being done—some 17 years ago—no data were available which would give a true indication of the changing difference in pressure between the material in the injection chamber and the material in the mould as the ram advanced. This pressure drop is not constant, and the factors having the greatest effect on it are: (1) state of fluidity of the moulding material; and (2) the amount of material in the injection chamber.

After much experimental work with this type of machine, a practical rule-of-thumb was worked out to the effect that flashing would occur if the projected moulding area was equal to, or greater than, the area of the injection chamber. It therefore followed that pressures higher than 2,500 p.s.i. were required for satisfactory operation of this machine.

The next step in the evolution of this transfer-type machine was the purchase of a special press designed for operation on 5,000-



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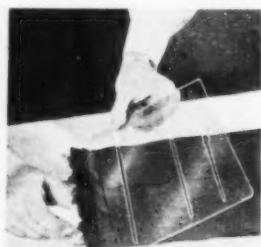
When the new press was finally put in operation, it was found that the new machine, operated at the higher line pressure, would satisfactorily produce thermoplastic injection moulded parts on a production basis. As time passed, many changes were made in the injection cylinder and the torpedo or spreader. Some injection cylinders were cored for high pressure steam for heating; others were designed to make use of electrical heater bands. All of these developments tended to increase the capacity and plasticizing efficiency of the injection cylinders. Although many of these presses have been converted to automatic operation, some are still hand-operated; even with the latter, as many as 1,800 complete shots have been pulled in a 71-hr. operating period.

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Among the latest aids designed to make house-cleaning easier for the home maker are new efficient



Broom Bristles of Plastics.

lightweight brooms. The high-quality performance of these brooms is achieved with bristles made from Bakelite Styrene plastic monofilaments which ensure a longer broom life and greater cleaning efficiency.

Exhaustive testing has proved that these new bristles last five times longer than conventional types and sweep cleaner. These resilient bristles make a tedious chore easier since they sweep in half the time previously required

and are extremely light in weight. They also raise less dust, are fade-proof, dip clean in warm suds and eliminate the untidy appearance of broken bristles because of their high strength. Their non-softening qualities in water or soap solutions are augmented by their resistance to various ingredients associated with kitchens or spilled liquids including vegetable oils, alcohol, alkaline cleaning materials, and nail polish. Attractive as well as practical, the new Bakelite styrene plastic bristles may be obtained in brilliant colours including yellow, blue or red with matching bumpers while broom handles are of smooth, gold-coloured steel. Although at present the major application of these new bristles is in household brooms, large monofilaments may be used for heavy scraping type brushes and street-sweeping brooms.

### TUNED TO QUALITY.

The first portable electric organ ever made—is this the electric reed organ, illustrated, which could well put the rudiments of a piano education within the reach of every family. The instrument, composed entirely of Bakelite phenolic and styrene plastic parts, with the exception of the electrical components, weighs only four pounds, is as small as a table radio, yet gives the full-bodied, sustained tones of a grand organ. On its twenty-five piano keys, beginners can get the feel of a piano keyboard and learn how to play rapidly.

This is another example of how plastics technology is bringing the enjoyment of playing music—not just listening to it—into more and more homes. The invention of sound-transmitting devices (the radio, phonograph, motion pictures, television) has carried music of all types to a tremendous new audience. The result has been the greatest demand for music in the history of the world. Millions of people want to enjoy it, be uplifted by it—and, most important, want to play it themselves.



Amongst our many standard mouldings may be the very item you are looking for. In any case, we would be pleased to advise and quote you for all types of custom moulding.

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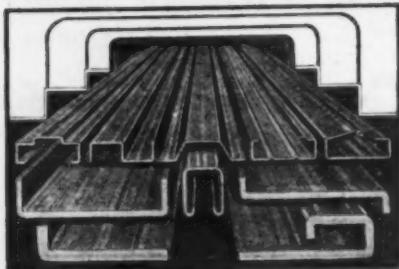
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This electric reed organ is a true musical instrument. Played on fifteen white and ten black keys, it has a range from low to middle to high C. Despite the in-



The new electric reed organ weighs only four pounds, is as small as a table radio, yet gives the full-bodied tones of a grand organ.

strument's small size (11" inches long, 7½" inches wide, and 5½" inches high), the keys are large enough to be played by any adult with ease and comfort.

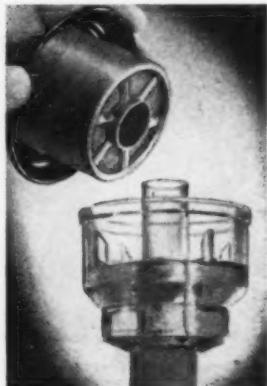
These keys, which are washable and durable, respond to the slightest touch of the fingers. Playing them produces rich, vibrant notes and chords. When amplified, these sustained tones are virtually indistinguishable from those of the larger organs.

The organ is ready to play when plugged into an electric socket. It operates on 110-115 volt, A.C. current. When A.C. current is not available, the instrument can be played with the aid of an inexpensive converter.

Because of its ease of operation and its low price, this electric reed organ seems an ideal way for a beginner to start his piano education. (The organ's two-octave range corresponds to the middle section of the piano keyboard.) Fingering exercises and the normal pieces studied during the first several months of training can be readily practised on this miniature organ. It has obvious advantages over the "silent practice keyboards" now in use.

The organ is built to wear well. The case is compression-moulded from phenolic plastics. The keys, comb, reed plates, compression chamber, and base are injection-moulded from Bakelite styrene plastics. All together, there are thirty-one plastic parts. These include one phenolic plastic case, twenty-five styrene plastic keys, one styrene plastic comb (with integrally moulded valves), one styrene plastic reed plate, two styrene plastic compression-chamber parts, and one styrene plastic base.

Colour is actually moulded into these plastic parts and will remain fresh and sparkling as long as the parts themselves. The case comes in wood-tone mahogany or walnut, duplicating the colour of most conventional organs, and it is styled to blend with any type of home furnishings. The gleaming case and keyboard can be



Outer case of this oil-bath air cleaner for fractional horsepower gasoline motors is moulded of transparent Tenite II cellulose acetate butyrate. Transparency of the case permits visual check of the oil level and the condition of the oil. The case holds a metal filter unit which cleans air before it enters the carburettor.

readily cleaned and polished with a damp cloth, since water cannot harm the plastic surfaces.

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Curiously enough, the idea of a portable organ is not new. The first instrument of its type was

patented. special-built all-plastic organ reeds to vibrate, producing the sonorous tones of the instrument.



Maximum comfort in the bath tub is made possible by inflatable bath lounge made of Vinylite film. The lounge weighs a little more than 1 lb. and has a comfortable seat, back support, and head rest. Suction cups on the bottom hold it in place on the bottom of tub.

actually described in a thirteenth century manuscript, "Cantigas de Santa Maria." This organ rested on the palm of the right hand and was actuated by a bellows which was manipulated by the left hand. It was, of course, diatonic; the first chromatic organ keyboard wasn't built until Halberstadt turned the trick in 1361.

In this new portable organ, the keyboard is chromatic (contains sharps and flats), and manual power is replaced by a fractional horsepower motor. Here's how the modern organ works; the motor propels a blower fan which forces air into a compression chamber. When the keys are depressed, the air under pressure is released. This causes the

### IMPROVED JAR CAP.

Greater protection is afforded cosmetics, chemicals, and some food products by an improved jar closure which combines metal and plastic materials. By providing a more efficient seal, the new cap is said to prevent evaporation or vapour transmission, which eliminates loss of moisture, flavour, and bouquet.

The new product consists of a tin outer shell, and a moulded polyethylene inner shell which carries the threads. For its first commercial use, the closure is being adapted to a brand of cream deodorant.

The tin outer shell, crimped around the edge to anchor the plastic insert in place, provides the necessary mechanical strength



Polyethylene inner cap, held by tin outer shell, prevents contamination.

for a rigid, virtually unbreakable closure, while the resilient polyethylene inner shell eliminates the

(Turn to page 49.)

# BX p.v.c.

Made by BX Plastics Ltd., London

(Subsidiary of the  
British Xylonite Company Ltd. 1877.)



Photograph by  
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Braines & Co.  
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Over three quarters of a

century of experience in the manufacture

of thermoplastic materials has gone into the development of BX P.V.C. Because of its excellent quality it is in ever wider use throughout the world in all its forms. It can be supplied as Sheet — flexible, embossed and rigid; Moulding compounds; Extrusions.

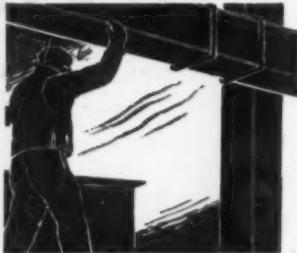
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(Continued from page 47.)  
possibility of contamination. The braking action of the plastic against the metal permits the application of high torque pressures—yet the cap is easily unscrewed. In addition, an effective reseal is obtained. Finally the flexibility of the moulded threads compensates for irregularities in jar threads. Polyethylene's translucency provides legibility for printed matter on the inside of the metal shell. The closure is produced only in the 38-mm. size.

#### PROBLEMS OF TRANSPORTATION OF ACIDS.

The problems of transporting dangerous-to-ship packages by air is being studied by the Packaging Branch of the Materials Laboratory at Wright-Patterson Air Force Base, Dayton, Ohio, U.S.A.

A new test chamber installed recently at the laboratory stimulates flight conditions posed by temperature, altitude and vibration. The chamber, which resembles a large walk-in vault, can be changed



The gallon-size polyethylene container being ground under heel here eliminate the hazards involved in transporting acids in glass bottles. For surface shipment the glass containers are safe enough, but air transportation is more strenuous.

from sea level to 50,000 ft. altitude conditions in three minutes and can have its temperature lowered 100 deg. F. in that same period. The operating temperature range of the test chamber extends from 165 deg. F. above to 65 deg. F. below zero. An especially designed vibration table installed in the floor of the chamber carries loads up to 1,000 pounds and has cycles of 600 to 3,600 vibrations a minute. The Wright Field chamber is the first to combine all three elements of temperature, altitude and vibration.

Tests conducted by the Air Materiel Command's Packaging Branch have resulted in the development of distinctive containers for dangerous items such as acetone, sulphuric and nitric acid, varnish, cleaning fluids, ethers, ammunition, etc.

Outer packages are usually made of metal, fibre, wood, while cushioning may be cellulose fibre, sponge rubber, fibre glass or curled hair and latex. Insulation is provided by any material that would



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ETHYL CELLULOSE; CELLULOSE ACETATE; NITROCELLULOSE; C.M.C. (Carboxy-methyl-cellulose); PARLON chlorinated rubber; NAVAL STORES—YARMOR, pine oil, medium alcohol content; YARMOR 302, pine oil, high alcohol content; THANITE, terpine derivative; HERCULES WOOD TURPENTINE, steam-distilled; DIPENTENE No. 122; SOLVENOL No. 1; WOOD RESINS; VINSOL RESIN; TRUERLINE pulverised core binders; STAYBELITE non-oxidising resin.



EUSTON WHITE LEAD, dry and in oil; NUODEX NAPHTHANATE DRIERS, guaranteed metal contents, cobalt, lead, manganese and zinc; MANOX BLUES, bronze and non-bronze; OXIDES, black, green, red, yellow; ALUMINIUM powder and pastes; CARBON BLACK; TANNERS' REQUISITES, oils, etc.; KEENOK single roll paint grinding mills; ROGERS FULL FLOW VALVES.

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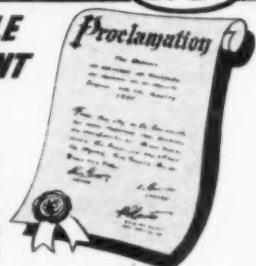
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Decentralised government brought progress to every section of our continent. Cities grew and trade and commerce prospered.

Primary production then depended almost entirely upon imports for its machinery but a new spirit of self-reliance was developing and a few years after the turn of the century the Nation witnessed the founding by Ronaldson-Tippett of an enterprise dedicated to the service of the Nation's primary producers.

Approaching the half century of its establishment, the Ronaldson-Tippett Organisation looks forward to the future with faith in the Nation and its people.



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prevent the transfer of heat and cold to the contents of the package, such as cork and asbestos. An air space often provides the most suitable insulation.

As an example of containers developed by the AMC's Packaging Branch, hydrofluoric acid is transported by air in a pliable bottle of polyethylene. A specially designed container of the same material is used for battery electrolyte for spare aircraft batteries. Thermometers and other mercury-filled items are packaged in outer containers of metal. The main problems of air transport are presented by extremes of temperature and pressure, which, of course, vary greatly with altitude. Pliable bottles of polyethylene it is said will solve many of these problems.

graved plastic cable-end ferrule.

Due to its durability, neatness and legibility, the last has always been regarded as the most satisfactory method of identification, but even this has its disadvantages, as many firms find it impracticable to carry large stocks of these specially engraved ferrules. In order to eliminate this difficulty, a British firm has designed a fully interlocking plastic ferrule consisting of several units,



Plastic ferrule for identification.

**CABLE END IDENTIFI-  
CATION SIMPLIFIED.**

To simplify identification in complicated electrical circuits, the use of some form of cable marker is now becoming standard practice. Various forms of marker have been employed, ranging from the hand-written paper tag to the more elaborate thimble-shaped, en-

each of which is engraved with a single digit or letter. From these an almost unlimited number of code numbers or combinations can be built; in fact, more than 1,000 different identifications can be made up from a stock of ferrules numbered from 0-9, using only a three-figure code.

To prevent the digits or letters from movement, each ferrule unit is made with a key and keyway (see illustration), which ensures



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**Terrace, Perth.**

that they can only be assembled with the engravings in line and cannot come out of alignment at any time. These ferrules can be supplied in black with white engraving or vice-versa and other colours can be supplied to order.

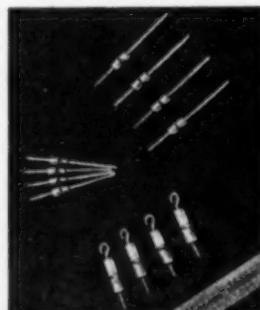
Entry of cables from both right and left, without one side reading "upside down" is provided for by ferrules being engraved for either hand as required.

### FLUOROCARBON MOULDINGS FORM SEALED TERMINALS.

Because of its unusual properties, a relative newcomer in the plastics field, has found a number of special applications. For example, certain hermetically sealed terminals called for a mouldable insulating material which would resist high operating temperatures, low ambient temperatures, salt water immersion, corrosive atmospheres, and other difficult conditions to which it may be subjected.

The only material which combined all these qualities and thereby made it possible to pro-

duce the terminals proved to be, this material, a high polymer of trifluorochloroethylene, which has good electrical insulation pro-

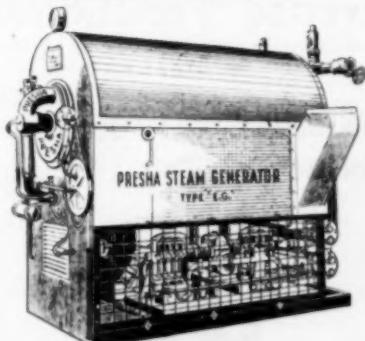


Individual hermetically sealed terminals are fluorocarbon insulated.

perties, is virtually invulnerable to any corrosive action, and can stand temperatures as high as 390 deg. F.

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The first such terminals were single-contact terminals. Multi-contact transfer moulded terminals, with the metal parts moulded in, have since been developed.

### VINYL DISPERSION RESIN.

The news from overseas that a plant for the manufacture of a new Vinylite dispersion resin, would be ready for production next year gives further concrete evidence of the remarkable growth in the use of vinyl dispersions.

A dispersion resin is generally defined in the trade as one which

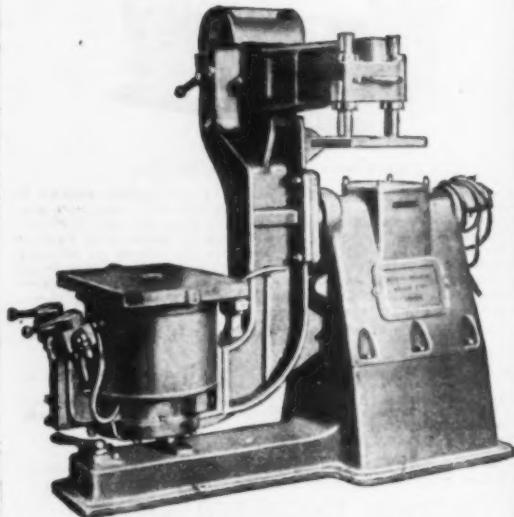
can be suspended in a liquid. Plastisols and organosols are of this nature, a plastisol being a dispersion of resin in plasticizer and an organosol a dispersion of resin in plasticizer and diluent. The same-type resin is frequently used for both. Dispersion resins are also frequently called paste resins. Principal uses for dispersion resins so far have been fabric and paper coating, slush moulding, and dip coating.

So popular have these resins become in the fabric-coating field that it is now estimated that over half of the coated fabric manufactured to-day is processed by the

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spread-coating method using dispersion resins. A considerable part of the spread-coated vinyl fabric has replaced the older type which uses nitrate coating. It is also presumed that the new resin will make inroads into the paper-coating field which has been dominated by solution-coating resin.

The advantage of the new dispersion resin over its older resins sold for this purpose is that it can be dispersed more easily. In fact, it is practically a stir-in-resin with no other equipment than a pony mixer required for preparation. Formerly it was necessary to use a ball-mill or paint-mill mixer.

### WINDOW SHADE CUTTER.

To provide retail-store employees as well as consumers with a convenient device for cutting down window shades to desired lengths, there has been developed a window shade cutter largely made of Tenite II cellulose acetate butyrate. The new tool is about the size and weight of a flashlight. It cuts to measure with speed and accuracy, is safe to use, and is reported to stimulate sales at shade counters. Considerable saving in counter and shelf space is also claimed for the new unit.

Dies were made so that both halves of the handle and cover are moulded in one shot. Moulding is accomplished on a 4-oz. machine.

Plastic was chosen because it offered the most inexpensive way of producing the desired shapes; provided a safe protective sheath for the knife; added attractiveness to the design; and gave the



Shade cutter has butyrate grip and cover. Marker is of same material.

tool a comfortable feeling when used.

Accompanying the cutter is a measuring unit also of Tenite II, which permits clerks to cut shades accurately to any of the three widths normally required. The marker comes equipped with a 54-in. steel rule and screws for fastening it to a counter. A carrying case provides the cutter with added sales appeal.

# Modern Servo-Mechanisms

## Recent Applications of Electronic, Pneumatic and Hydraulic Control Equipment

Without doubt, one of the most important trends in engineering design is towards the conservation of manual effort. This does not only mean in the utilisation of power which can be controlled with small expenditure of energy, to perform work in excess of that possible by unaided manual effort but, through the functioning of correctly designed controlling devices, to carry out a multiplicity of operations which, if controlled individually by manual methods, would, in many instances, require considerable duplication of manpower.

THE objective of these "slaves of industry" is not in any way restricted to the conservation of manpower, for applied to many operational and productive processes control may be achieved to secure a degree of efficiency and accuracy that would not be possible, if, in their performance, they were subject to the element of error always present in manual control.

From this it will be seen that the main purpose of a control system is to regulate, or govern, a flow of energy and thus not only do they vary in arrangement and complexity, depending on the nature of the functions they are intended to perform and on the required speed and accuracy of their operation, but they differ also according to whether their operation is independent of or dependent upon the flow of controlled energy.

Covering a wide field of application, the employment of servo-mechanisms in any one industry provides an inexhaustible subject for discourse and so permits a very brief survey only in article form, whilst, complete coverage offers a rapidly diminished picture. However, bearing in mind the similarity existing between various processes, it is of interest to review a few specific examples of electronic, pneumatic and hydraulic servo-controls employed to overcome practical engineering problems, as encountered in modern workshops, processing and operating plant and transport; particularly so as the fundamental theory of servo-mechanisms constitutes a well-trodden path in technical papers.

### MACHINING OPERATIONS.

The term "servo" or "slave", as used to denote the accurate manner in which the output load follows the input load, is described by Frank H. Slade in "Machinery Lloyd". He refers to what may be regarded as the underlying principle of servo-mechanisms applied to controlling machining operations.

He describes a profile milling machine arranged for the duplication of a profile or model, so reducing an intricate machining operation to one which can be carried out by an unskilled worker.

Both model and workpiece are mounted on a common support, so

providing identical lateral displacement and the profile of the model is traced by a lightly loaded feeler gauge in its travel past the point of contact. Motion of the gauge about a pivot is transmitted to a differential device consisting of a pulley and cord, associated with a potentiometer and battery.

The other side of the differential device is connected to an extension of the frame carrying the milling cutter and which is arranged to be driven, to secure a vertical displacement, by a servo-motor actuated through an amplifier, by the error voltage developed by the differential-operated potentiometer.

As the feeler gauge represents the input number and the frame constitutes the output load of the servo, it is pointed out that a downward motion of the gauge point causes an upward motion of the differential pulley, resulting in a corresponding potentiometer voltage being supplied to the servo-motor through the servo-amplifier. For a proper electrical

connection polarity of the motor, the latter then drives the frame and milling cutter downward by an amount equal to the displacement of the feeler gauge in order to zero the differential voltage. Similarly, an upward displacement of the feeler point results in an equal upward displacement of the cutter.

The principle of employing a model to control machining operations has been extended to modern lathes. One, designed for an average production of 30 to 50 cranks per hour, is a two-spindle machine that will simultaneously rough or finish turn pin bearings on both spindles.

Two master crankshafts, enlarged duplicates of the crank to be machined, pattern the movement of tools on the lathe's two spindles and provide the input impulse for controlling this movement through the cycle of rapid traverse to start of cut feed movement to the sizing stop, and rapid return to starting position.

Rapid developments in the use of electronic servo-mechanisms are

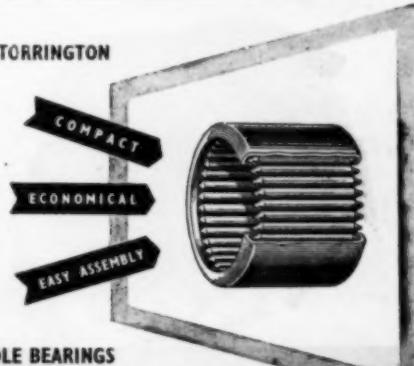
observed in the manufacture of radio receivers, for, by this application, the complete operations of grinding, metallising, face milling and finishing of an integral part of the receiver is made automatic and continuous. In an interesting example the part, a small plastic plate approximately 7 in. square, forms the basis of the completed receiver and contains various grooves and depressions on each side, which, when filled, the metal and graphite by purely mechanical means become inductors, resistors, capacitors, potentiometer tracks, switch and other terminations and conductor paths between them.

A very brief survey of the processing plant described shows that a series of plates are placed in a loading mechanism, where their presence is photo-electrically registered by a master electronic control unit. Impulses from this unit operate a feeding mechanism that passes the plates on a rubber conveyor at regular intervals through an automatic grit-

(Turn to page 55.)

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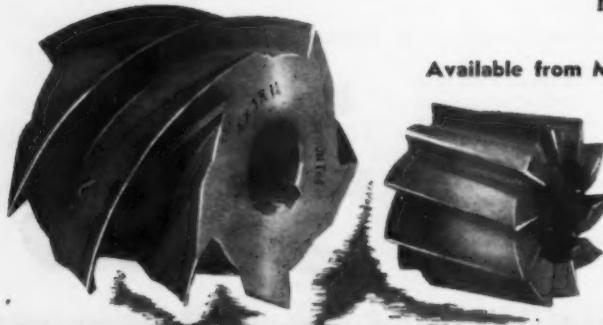
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(Continued from page 53.)

blasting machine, which, electronically controlled, does not commence operations until a plate arrives for blasting.

Each plate is checked for surface roughness by means of a photo-electric device before it passes to the metallising process. The arrival of a plate on the conveyor is perceived by an electronic control unit, which starts the process timing cycle and regulates the admission and ignition in the correct sequence, of ethane, propane and oxygen; also starting and controlling the supply of zinc wire into the melting flame and admitting compressed air for atomising and spraying the molten metal.

After metallisation, the plates are conveyed to rubber rollers which feed them over the face plates of a face-milling group; consisting of three electrically driven milling heads, each mounted on independent slides capable of fine adjustment and equipped with diamond-tipped tools operating at a speed of 3,000 ft. per minute.

This machining operation is also electronically controlled and is so arranged that the cutting heads attain their full operating speeds before the metallised insulating plate is fed in. The metal is removed from each side of the plate until the insulating material is reached, so that the only metal remaining is that in the grooves and depressions in the plate and this forms the interconnected circuit complete with inductors, capacitors and connections.

After the circuit has been automatically tested, whilst still on the conveyor, plates containing resistors are passed to a cubicle for spraying with graphite through stencils that are automatically applied and indexed after having been automatically cleaned and dried. This spraying operation is automatically timed to ensure the accuracy of resistor values, control being effected by means of automatic resistor-testing equipment further along the conveyor, whilst consolidation and resistance stability of the graphite deposits are secured by burnishing.

Subsequent operations introduce the need for some manual aid, but, wherever possible, the finish-

ing processes are automatic and servo-controlled, even up to an automatic packing and sealing equipment, that is also part of the total production line, before leaving by conveyor for the outward stores.

### CUTTING AND WELDING.

Considerable importance may be attached to the recent advances in the design of electronic tracing heads for oxygen cutting machines, as these obviate the difficulty formerly experienced in cutting corners and the damage to drawing by tracing wheel during a repetitive run.

The electronically controlled tracer drive incorporates a spot of light no larger than a pin-head that is projected downwards, from a position adjacent to the tracer wheel, on to a drawing placed on the drawing table of the cutting machine and the burner follows that path traced out by the light along the line.

To operate a cutting machine fitted with the electronic tracer it is only necessary to lay a paper drawing on the table and switch on and it is claimed that the movement of the cutting burner is controlled as accurately as when using a solid type of template, or model; in fact, the drawing then becomes a template, simple to produce and easily modified.

The tracer head contains two motors, one for driving and one for steering. The driving motor, which has a variable speed, is employed to rotate the tracer wheel, the steering motor is employed to steer the vertical spindle of the tracer wheel drive, and this spindle is directly coupled by gearing to the projecting lens housing which throws the spot of light on to the drawing so that one revolution of the tracer wheel spindle imparts one revolution to the projecting lens housing.

The beam of light, which produces the spot, is set slightly off centre in the housing so that as this rotates the spot revolves in a circular path. The housing is set in relation to the tracer wheel, thus the spot is in front in the line of travel. Mounted on the side of the beam housing is a photo-electric cell and this is connected through a special circuit to control the speed and direction of rotation of the steering motor.

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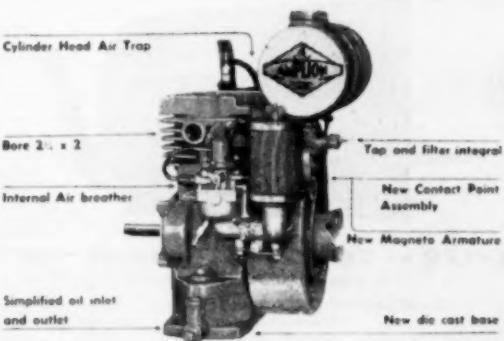
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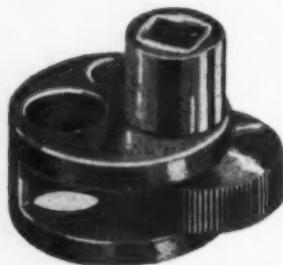
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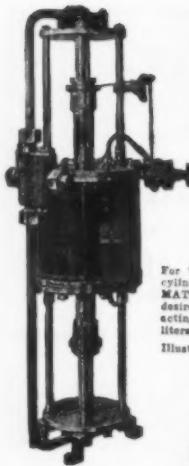
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The drawing is made to any outline required, and the line of the drawing is made about  $\frac{1}{8}$  in. in thickness, the edge corresponding to the shape it is desired to cut out. In operation, light from the beam is reflected from the paper drawing and when the spot is half over the black and half over the white the amount of reflected light is such that the steering motor remains stationary. Immediately the tracer wheel causes the spot to move either more over the black or more over the white then a signal is sent to the motor which moves it back to the centre position again, the speed depending on the rate of change. Due to the pivoting action of the light spot, a regular motion is imparted to the steering spindle without any oscillations.

Developments in servo-mechanisms design, in the field of electronic equipment, have also been applied extensively in recent years to the control of welding operations. By this means automatic machine welding becomes a practical proposition and in consequence, not only is the need for highly skilled operatives avoided, but high quality results are secured, even though the machines may be manned by operatives with little knowledge of welding processes.

In a description of large scale welding of railway carriages by batch production methods, it is observed, for example, that the welding of side sheet stiffeners is carried out by an automatic multiple spot welder. An outstanding feature of this machine is its automatic indexing and movement of the tables.

All indexing is accomplished by photo-electric cells, with the light source and cells mounted near one side of the table so that they may easily be controlled by an indexing pattern. Two rows of holes running the full length of the table are placed so as to pass

between the photo-cells and light sources. All holes are filled with loose rivets preventing light from passing through. When a rivet is pulled out of a particular hole, the light admitted operates the photo-electric relay to make a weld in the corresponding position. Any desired pattern of spots can thus be easily set up.

The second, parallel, row of holes controls retraction of the electrodes. By selecting the proper rivet to be pulled out of its hole, the electrodes can be made to retract in any desired position. The table is automatically controlled to such an extent that it will, if desired, move to the centre on finishing the work on one end and start welding on the work that has been loaded on the other end.

#### HEAT TREATMENT.

Analogous to welding processes, the progress made in the heat treatment of articles bears a direct relationship to the advances made in applied servo-mechanisms. For example, the introduction of radiation pyrometers to comply with the need for a temperature-sensing device or input member, of very rapid response, has made possible the successful control of high-gradient heating in the steel industry.

A specific case of this form of control is found in the high-speed pre-heating of seamless steel tubes. Re-heating the tubes to the proper temperature required for final sizing is carried out in a new continuous high temperature, fast speed line of thirteen furnaces wherein the tubes, after passing through the piercing and reeling operations, require, on an average, only 0.487 minutes to attain the desired sizing temperature, whilst any increment of tube is in each furnace for approximately 0.037 minutes. It is claimed that it is only because of

(Turn to page 58)

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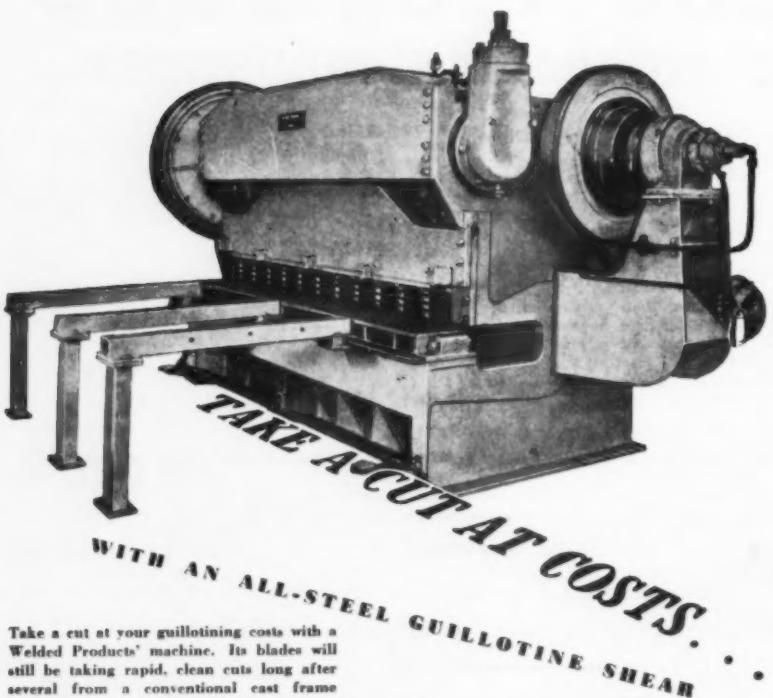
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SPECIALISTS IN ROLLED STEEL MACHINERY

(Continued from page 56.)  
the rapid response of the radiation temperature detector, plus the fast reaction of the furnace temperature to a change in fuel supply, that effective automatic control can be maintained; so that, under good average conditions, the tubes leave the final furnace at a temperature either plus or minus 20 deg. F. of the instrument set points.

In the high limit temperature control zones, the radiation detecting elements are located at the entrance end of each of the thirteen furnaces and sight on the moving tube just as it enters the furnace.

These elements are connected to recording electronic potentiometer pneumatic controllers, which regulate the supply of fuel to the furnaces by throttling diaphragm motor control valves fitted in the pre-mixed air-gas supply manifolds.

The set point, ranging from 1,650 deg. to 1,800 deg. F. on each of the tube temperature controlling instruments is adjusted manually for each size and type of tube to be run and rather than employ different temperature settings for each furnace, it has been found more practical to set all furnaces for the same temperature, since the tubes make their own gradient as they pass from furnace to furnace.

All thirteen furnaces are equipped with photo-electric cells at their entrance end, and the light source is so located under the path taken by the tubes when passing between furnaces that the light beam to the photo-electric cell is broken when a tube is present.

When no tube is present, with the light beam unbroken, the photo-electric cell actuates through a time-delay relay, three-way solenoid valves, automatically cutting the furnace back to minimum fire by bleeding air from the diaphragm motor valves in the pre-mixed air-gas manifold line. A by-pass line, with a manually operated valve, is installed around each diaphragm motor valve to permit minimum fire to be maintained when the diaphragm motor valve is closed and, at the same time, the instrument balancing motor is de-energized. The electronic power pack in the instrument, however, remains energized.

In this manner, the recording pen remains at or near the tube temperature and the instrument is ready to assume control the instant the reverse action takes place, that is, when the light beam is again broken.

To afford maximum protection to the tubes as well as to the furnace proper, a system of automatic high-limit furnace temperature control is provided; the line of thirteen furnaces being divided into six zones for this purpose. Of the thirteen furnaces the first five zones comprise a pair of adjacent furnaces and the sixth zone, three furnaces, whilst only one furnace in a given zone is used as a criterion of temperature measurement for that zone.

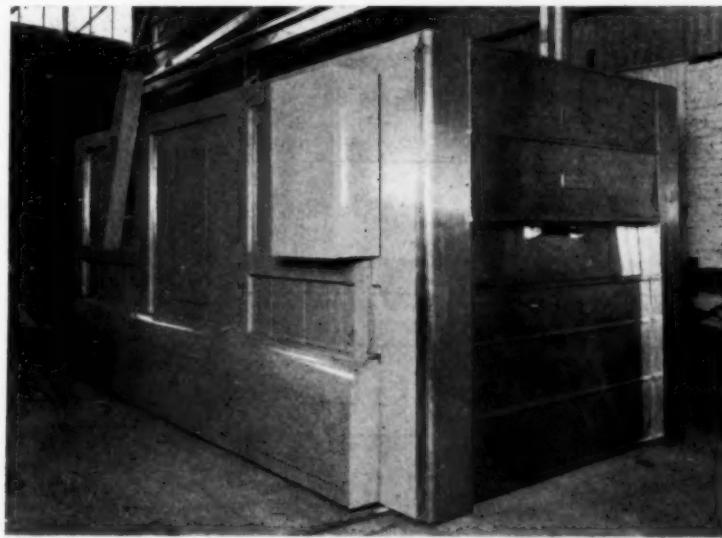
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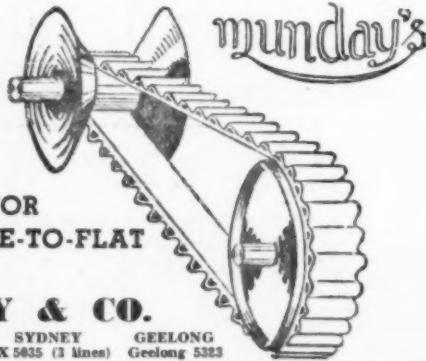
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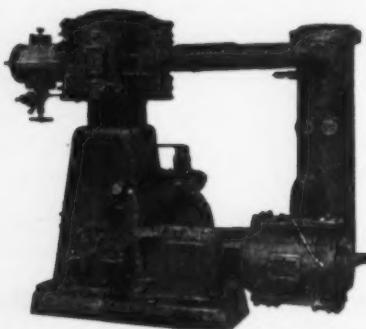
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Rates on application.

(Continued from page 58.)

A radiation detector sights into a closed-end, silicon carbide target tube which is mounted through the furnace wall. This detector is connected to a circular scale indicating electronic potentiometer, calibrated from 1,200 deg. to 2,900 deg. F., and equipped with three adjustable electric contacts to provide the following control action.

Should the temperature at which the first contact is set be exceeded, the three-way solenoid valves are de-energized, causing the furnaces to be put on minimum fire. Should the temperature continue to rise, causing the second contact to be made, solenoid valve is energized, permitting air to bleed into the combustion controller and leaning the gas-air mixture. Finally, should the temperature still continue to rise, causing the third contact to be opened, solenoid valve is de-energized, cutting off the supply of gas entirely.

The temperature high-limit set points are fixed manually at the start of a run and, as with the tube temperature controllers, vary with the type of material being processed. Normally, the high-limit temperatures are within the range of 2,400 deg. to 2,600 deg. F.

Another heat treatment process in which servo-mechanisms are playing an important role is in the hardening of dies by induction heating methods. The article in "Machinery Lloyd" refers to a high-frequency induction-heating machine for progressively hardening press-brake forming dies, equipped with a sensitive electronic device which, correlated with the heat output of the work coil, automatically regulates the speed of the work transversing carriage to provide a uniform hardening depth for the full length of the die.

The operator selects the proper carriage travel rate for the depth of hardness desired and then connects the speed-control unit to ensure a uniform product.

### PLANT CONTROL.

It is now considered good practice to control operating plant automatically wherever possible. Thus, large, high-temperature, high pressure centrifugal feed pumps operated continuously at

constant speed may be cited as a good example. Here the manufacturers recommend the use of automatic control at flows less than 10 per cent. of their rated capacity.

One system is said to be designed to offer simple, reliable automatic control of the by-pass line. Control is based upon the direct measurements of the water passing through the pump rather than indirect indications of flow and the orifice plate is located in the suction side of the pump in order to measure the total flow through the pump, since, for pumps having separate balance devices, the leak-off from the balancing device is circulated directly back to a hot well, deaerator, or some other point in the low pressure water system.

In the main the functions performed are: (1) the amount of liquid flowing through the pump is measured, (2) a control valve in the by-pass line is opened to allow some liquid to recycle when the amount of liquid being pumped falls below a safe minimum, thus assuring the passage of a safe amount of liquid through the pump, (3) the valve in the recycle line is closed when the amount of liquid flowing through the pump is more than the minimum amount which the pump can safely handle.

It is stated that under normal conditions, when sufficient water is flowing through the pump, the valve in the by-pass line is kept in a closed position. Fifteen pounds per square inch of air pressure is applied to both the diaphragm motor valve and the relay. The relay will decrease the air pressure in the output line in direct proportion to the increase in air pressure in the input line from the flow controller, and vice versa.

In this case, no air pressure is supplied by the relay to an index mechanism located in the flow controller. The index functions to drive the set point index upscale an amount proportional to the air supplied to it, but, with no air supplied, the set point index is allowed to fall down-scale until it engages the lower limit stop, which indicates safe flow for the pump.

If the boiler demand decreases enough so that the flow falls to

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PACKAGING MEDIUM

provides an unrivalled rapid method for thoroughly protecting metal parts and the more simple assemblies against corrosion.

Reduces packing time by at least 60% in man-hours, an important consideration in these times, offering simultaneously completely adequate protection for the coated article against all forms of corrosion, damage or abrasion, mishandling, etc., during transit and storage even under extreme conditions.

GLOSCOAT gives excellent protection in all conditions likely to be encountered, particularly in hot, humid atmospheres or in extremes of cold. Furthermore, the coating can be easily removed by a simple stripping operation, revealing the components ready for immediate use, lubricated with a film of pure lubricating oil, automatically exuded from the plastic coating.

NOTE: The removed GLOSCOAT can be remelted repeatedly for further use.

**METHOD OF APPLICATION:** GLOSCOAT is applied by a simple dipping operation, using a special melting tank, as illustrated, to avoid local hotspots and overheating of the plastic.

A temperature of 180°C.-200°C. is recommended for coating purposes, working within these limits, the thickness of coat can be varied to suit individual requirements. For example, a thickness of .000in. is applied when the article is dipped at 190°C.

GLOSCOAT is thermoplastic and sets almost immediately after the component has been removed from the tank.

### ADVANTAGES OVER OLD METHODS:

The light coloured transparent coating enhances the sales appeal of the coated article. For example, data engraved on gauges, tools, etc., encased in GLOSCOAT is visible to clients and articles can be handled freely without the danger of corrosion from the moisture of the fingers. Its high impact resistance gives protection against accidental damage through dropping.

- GLOSCOAT in one operation completely preserves and protects.
- GLOSCOAT is easy to apply and simple to remove.
- GLOSCOAT eliminates preservatives and desiccants.
- GLOSCOAT reduces bulk of packed articles, an important consideration if transmitted by air freight. Parts coated are ready for immediate use when received, as no greasing is necessary.

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the lower set point, the flow controller supplies zero air pressure to the relay and diaphragm motor valve. The valve is spring-opened and permits recycle water to flow back to the pump. The relay actuates the index with fifteen pounds of regulated air pressure, thus driving the set point index upscale until it engages the upper limit stop. Cycling is prevented by setting this stop at a flow equivalent to the sum of the minimum safe flow plus the recycle flow.

The foregoing, as will be observed, only deals with electronic, electronic-pneumatic and pneumatic servo-mechanisms, but servo-hydraulic systems are of equal importance as these may be applied to effect centralized control and automatic sequence operation and control, to give servo-assistance to any hand-operated control and to power drive units, for example, where intermittent movement at controllable speed is required.

The subject is, of course, very wide and space precludes other than a brief review of a few applications. A good example of sequence operation as applied to modern plant is to be seen in large water gas generators. To enable the best possible gasification results to be obtained and to enable every particle of time to be fully utilised for gas making, it is essential that all valves are automatically timed and mechanically controlled.

The valves should be arranged for operation through mechanical power, be this by levers, hydraulic or compressed air motors, solenoids or electric motors; hydraulic operation being the most commonly employed means for large units. However, it is given that, in general principle, the various valve-controlling systems all serve the same object, namely, during a cycle of, say, three to four minutes to open and close a certain number of valves in their pre-determined sequence and to come

into action and call for help in the event of being prevented from fulfilling this function.

It is of interest to observe that the valve controller, for the hydraulically controlled valve, consists of a series of small pilot valves which in their turn are operated either from an electrically or mechanically driven shaft, whilst the contactor gears for the electrically operated valve are mounted on a shaft similar to a clock, and the contactors on the same, make or break contact with motors and/or solenoids mounted on the various main valves.

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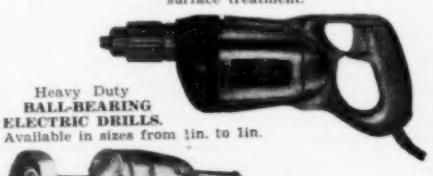
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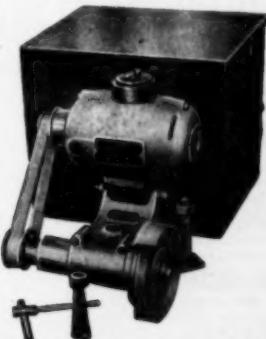


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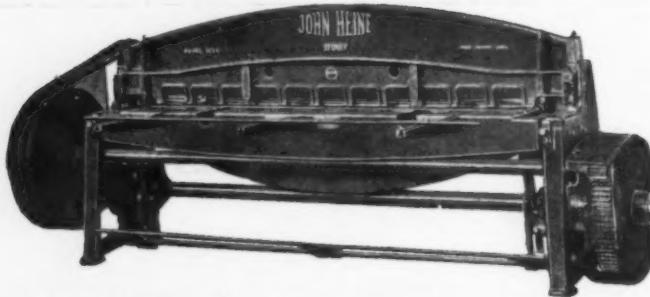


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# PATENT & TRADE MARK NEWS

Complete specifications lodged with the Patents Office are open to public inspection almost immediately after their lodgment.

Interested persons are now able to obtain the details of an invention for which protection is being sought.

Provision is also made (Patents Act, 1946) for an applicant to obtain damages, if infringement occurs, from the date of publication of the application. A rule of practice has been established whereby an application will be examined more speedily when a prima facie case of alleged infringement is proved.

Particulars of the necessary procedure will be supplied by any Patent Attorney practising in the Commonwealth.

## PATENT SPECIFICATIONS ACCEPTED

### NEWSPAPER WRAPPING MACHINE.

138,066.—D. I. Munro.

Claim 1. An improved rolling and wrapping machine for newspapers and like articles comprising a hopper for receiving a stack of the articles, a selector for transferring the articles singly from the stack to a rolling mechanism.

which is carried by a rotatable framework and rolls each individual article, means for feeding a wrapper to each rolled article and wrapping it around the same, means for securing the wrapper in position around the rolled article, and an ejector which removes the wrapped article from the rolling mechanism.

### APPARATUS FOR DEVELOPING ING PHOTOGRAPHS.

138,064.—H. A. Rigby.

Claim 1. Improved apparatus for photographic developing purposes, comprising a frame for

holding and supporting a relatively large number of negatives or the like while they are undergoing treatment in tanks or baths, the frame including upstanding side walls provided at relatively closely spaced intervals with vertically extending open-topped slots, a base formation having a longitudinally extending section provided with open-topped slots, slotted or the members projecting sidewardly from said upstanding side walls, and a longitudinally extending upper member having vertically extending open-bottomed slots, the slots of all the members being aligned with each other substantially as and for the purposes specified.

### SPRING MOUNTING OF TYNES.

138,069.—R. S. Tilly.

Claim 1. In agricultural implements an improved spring mounting for tynes characterised by a transverse shaft secured to the frame of the implement, a bearing member rotatable on said shaft and having a sleeve exten-

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BOTTOM—Sectional view of Babcock-Detroit RotoStoker.



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sion, a tyne carried on said bearing member, a collar secured to said shaft, a helical spring carried on said sleeve extension and adapted to apply tension between said collar and said bearing member.

### SAFETY DEVICE FOR ARC WELDING

138,071.—R. C. K. Young and T. Sampson.

Claim 1. A safety device for arc welding apparatus, characterised by two relays arranged to control operation of a contactor for said apparatus, said relays being operated by alternating current or by direct current derived from a rectifier connected across the secondary of the welding transformer of said apparatus, one of said relays being designed to close when voltage across said secondary drops at the commencement of welding operations, and the other relay being designed to open when said voltage approaches a level dangerous to the operator.

### POCKET CLIP FOR FOUNTAIN PEN.

138,073.—The Lang Pen Co. Ltd.

Claim 1. A pocket clip for a fountain pen or like article wherein the retaining ring is in line with, or in the same plane as, the arm of the clip instead of being at right angles thereto and is adapted to be received in a slot formed for the purpose in the end of the article and to be prevented from outward displacement by a member carrying an abutment engaging the rear or interior of the slotted end of the article.

### ELECTRICALLY HEATED STEAM IRONS.

138,075.—National Pressure Cooker Co.

Claim 1. In a steam iron, in combination, a sole plate having a pressing face, heating means in heat conducting relation with the sole plate, a boiler disposed to receive a limited amount of heat from said sole plate and adapted to hold water, means for transmitting steam generated in said boiler to the pressing face of the sole plate, and a metallic heat-conducting member in heat conducting relation with the heating means, said member extending into the boiler and being adapted to heat the water to steam.

### ELECTRIC HEATING DEVICE.

138,079.—L. Mandl.

Claim 1. An electric heating device consisting of a U-shaped conductor supported by its ends from a holder through which current of low voltage, namely 0.2 to 6 volts, preferably 1 to 2 volt, is supplied, said conductor not being supported on any other portion of its length.

Claim 7. An electric soldering or branding tool as described in claims 1, 2, 3, 4, 5 and 6 capable of being bent repeatedly to a shape most suitable for the work to be performed.

### SCREW FASTENING DEVICE.

138,080.—G. L. Ericsson.

Claim 1. In a screw device for fixing a screw in a structure such



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as a wall, roof and the like the combination of a screw and an end member for the screw which is in threaded engagement with the screw but which is non-rotatable in function, said member having prongs around the screw which are so adapted as to coat with a conical surface of the screw that upon rotation of the screw inwards in relation to the structure the prongs will expand and secure the end member in the structure before turning the screw to the fixing position, said member being tapered in the free end to form a nail point so that the screw and said member together will comprise a fixing element which is primarily driven into the structure like a nail and secondarily fixed like a usual screw in the end member.

### FLEXIBLE GUIDE MEMBER.

138,062.—Tecalemit Ltd.

Claim 1. A flexible guide member for guiding a slideable member in its movement, the flexible guide member being integral with, or securely connected to, the slideable member and being slideable within a guide surface in an envelope or housing and comprising or consisting of one or a number of flexible parts which is or are attached to the slideable member, and a peripheral edge part which is slideable in the said guide surface, the arrangements being such that if the peripheral edge part should encounter an obstruction which causes it to stick, then the said flexible part or parts will flex sufficiently to permit the said slideable member to move as required.

### AUTOMATIC ELECTRIC ARC WELDING APPARATUS.

138,314.—Welding Supplies Ltd.

Claim 1. Apparatus for electric arc welding of the type described wherein means are provided for limiting the extent of movement of the carrier member towards the work, and wherein the welding rod holder is attached to said carrier by a swivel joint, means being provided for limiting the angular movement of said holder about said swivel joint in the direction away from the work.

### TRADE MARK APPLICATIONS

94,774. "Falcon." Agricultural and horticultural machinery.—Pope Products Limited, Charles Road, Beverley, South Australia.

96,603. The word "Locke" incorporated in a label design. Insulators made of porcelain or earthenware.—Locke Incorporated, South Charles and Cromwell Streets, Baltimore, Maryland, U.S.A.

94,942. Label design showing, inter alia, the word "Douglas." Industrial trucks and electric de-

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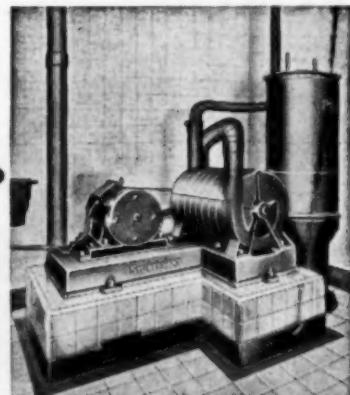
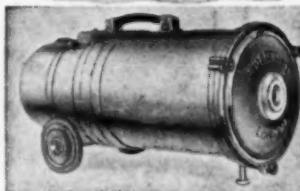
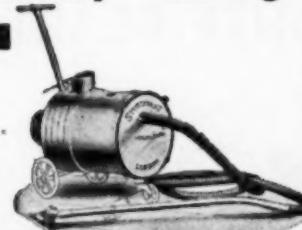
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livery vans.—Douglas (Kingswood) Limited, Hanham Road, Kingswood, Bristol, Gloucester, England.

96,466. "Rugbias." Batteries.—Century Storage Battery Co. Ltd., Birmingham Street, Alexandria, N.S.W.

96,437. "Pedestrian." Sole leather.—Joshua Pitt Pty. Ltd., Gadd Street, Northcote, Victoria.

95,250. "Silcrest." Alphabetical indexing tags; file binders, etc.—Matthew Peace Sinclair, 12 Gadd Street, Northcote, N.16, Melbourne, Victoria.

89,809. Circular design of the letters GACO. Goods manufactured from India-rubber and gutta-percha.—George Angus & Co. Limited, Angus House, 152-158 Westgate Road, Newcastle-on-Tyne 1, Northumberland, England.

88,137. A label design of the letters "G.G." Gaskets, packing and hose.—Gardiner Gasket Manufacturing Company, Hunt and Commonwealth Streets, Sydney, N.S.W.

96,503. The letters "R.O.K." in a label design. Adhesives used in industry.—Potter Brown Adhesives Limited, 17 Palmerston Building, Queen Street, Auckland, New Zealand.

95,824. "Cotalace." Insulating or protective or decorative coatings and substances for yarns, threads, cords, tapes and wires.—Australian Plexon Proprietary Limited, Bradmills House, Missenden and Parramatta Roads, Camperdown, N.S.W.

97,221. "U-Namel." Paint.—Coverwell Paint Co. Pty. Limited, 6 Emily Street, Roselle, N.S.W.

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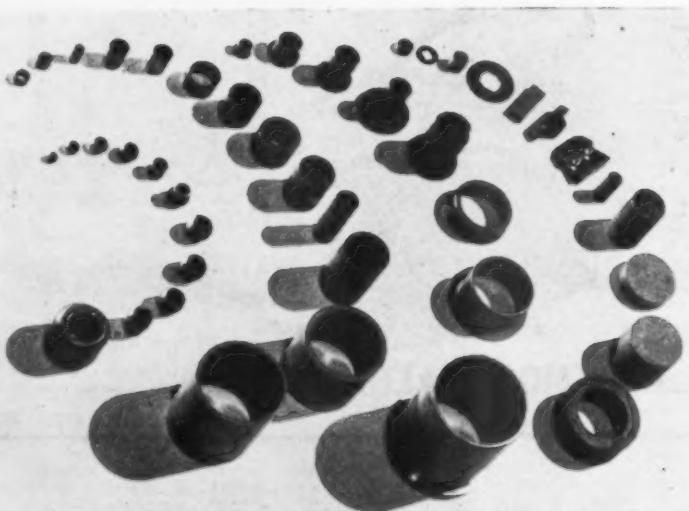
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96,829. The word "Safeguard", with a lock and chain. Leather wallets.—Taylor Hylton & Co. Asbestos House, 65-69 York Street, Sydney, N.S.W.

96,846. "Diozene." Photographic sensitized paper.—Plan Printing & Supplies Pty. Ltd., Lawson House, 49 Clarence Street, Sydney, N.S.W.

97,043. "Silver Line." Stationery.—Harold Edward Hyde, 184 Brunswick Road, East Brunswick, Victoria.

95,282. "Neaton." Furniture cream and plate powder.—Kemol Proprietary Limited, 47 Moreland Street, Footscray, Victoria.

96,659. "Plastikool." Hand-wheels, valves and valve fittings of plastic.—M. B. John Limited, Armstrong Street, South Ballarat, Victoria.

#### TENDERS FOR PATENTS

"IMPROVEMENTS IN OR RELATING TO SHEET STEEL AND METHOD OF MAKING THE SAME", and "IMPROVEMENTS IN OR RELATING TO REELS FOR COILING MATERIALS"

Commonwealth. Patents Nos. 117,207, and 101,569. The Patentees of these inventions desire that they be adopted and brought into commercial use and manufacture in Australia, and invite inquiries to this end from persons and firms interested.

Address inquiries to  
**SPRUSON & FERGUSON,**  
Patent Attorneys, of 16-18 O'Connell Street, Sydney.

"IMPROVEMENTS IN OR RELATING TO THE SEPARATION OF SOLID MATERIALS OF DIFFERENT SPECIFIC GRAVITIES"

Commonwealth Patent No. 117,465. The Patentees of this invention desire that it be adopted and brought into commercial use and manufacture in Australia, and invite inquiries to these ends from persons and firms interested.

Address inquiries to  
**SPRUSON & FERGUSON,**  
Patent Attorneys, of 16-18 O'Connell Street, Sydney.

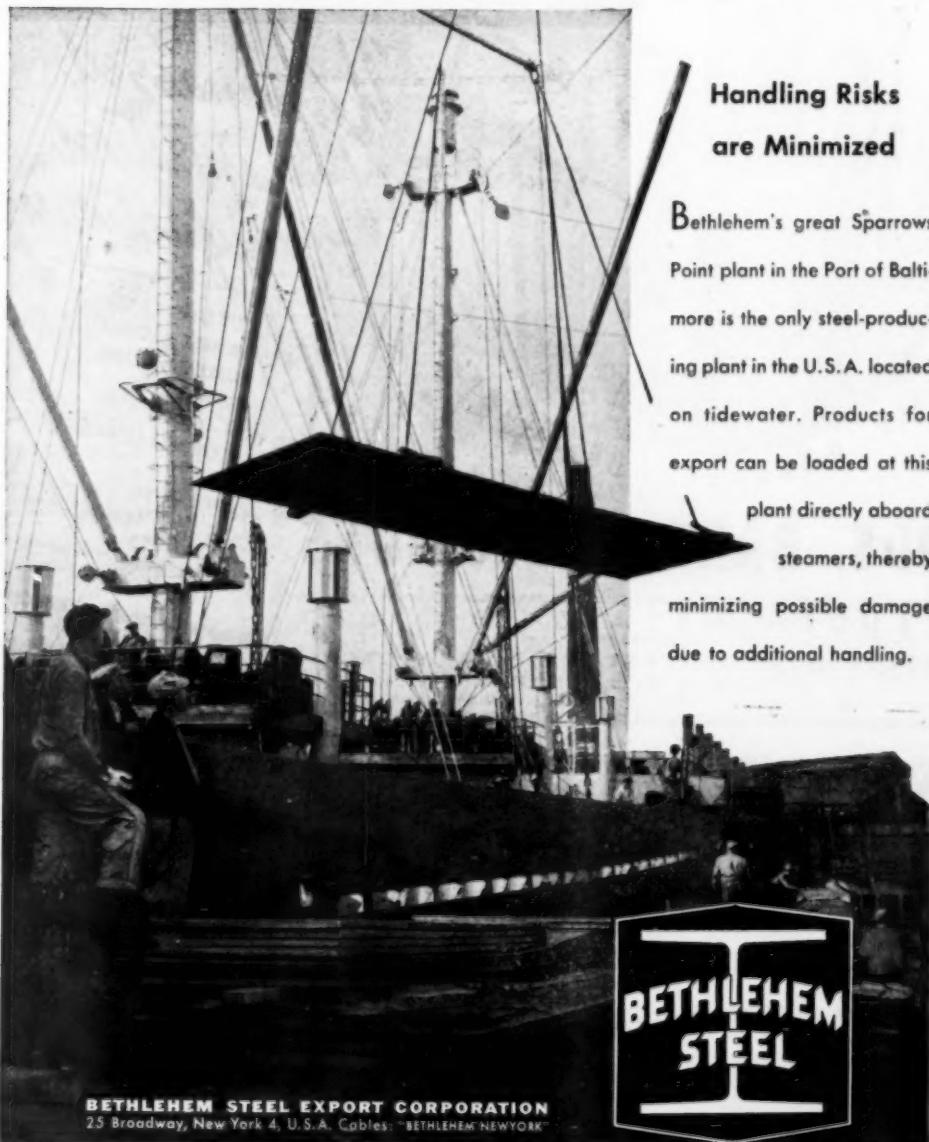
HARRY ARMIN RUSH, the proprietor of Australian Patent No. 116,789, for "Improvements in Immersion Type Electric Water Heaters", invites inquiries from persons interested in manufacturing or using the patented invention in Australia under licence or other arrangement.

Address inquiries to  
**A. WALLACE SMITH, Patent Attorney,** 358 Collins Street, Melbourne.

"UPHOLSTERED CHAIRS." The Proprietors of Australian Patent 126,787, "Improvements in or relating to Upholstered Chairs and the like", desire that the invention be adopted and brought into commercial use and manufacture in Australia, and are prepared to satisfy all requirements of the public, and invite inquiries to such ends from persons and firms interested. Inquiries to  
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"Erie" Board Drop Hammer (File No. 50/3464). McPherson's Ltd., £2,275.

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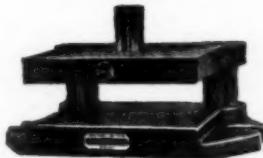
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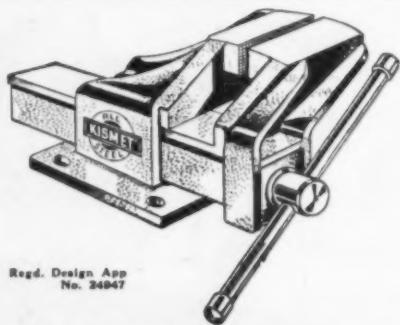
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(Turn to page 76.)



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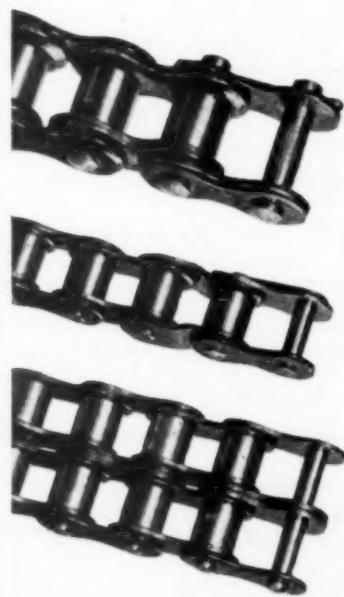
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# CURRENT TENDERS

### NEW TENDERS

The following tenders have been called since our last issue. Current tenders which have been published in previous issues follow this section.

#### COMMONWEALTH

##### POSTMASTER-GENERAL'S DEPARTMENT.

B.P.O. Standard Uniselector Maintenance Parts (Sch. C.6426). Jan. 16.

Bolts, U., Hook and Screws (Sch. C.6450). Nov. 9.

Bolts, Hexagon or Square Head or Cuphead (Sch. C.6449). Nov. 16.

Broadcasting Transmitters, Radio Telephone (Sch. C.6435). Dec. 14.

Enamelled Signs (Sch. C.6459). Nov. 21.

Nuts and Washers (Sch. C.6451). Nov. 14.

Solder (Sch. C.6458). Nov. 21.

Teletypewriter Table and Silence Covers (Sch. C.6439). Nov. 28.

##### DEPARTMENT OF EXTERNAL TERRITORIES.

Sporting Goods (Sch. 238). Oct. 30.

Telephone Materials (Sch. 235). Oct. 30.

##### DEPARTMENT OF WORKS AND HOUSING.

Air Conditioning System, for Fivedock. Nov. 14.

Dual Pressure Controls, Thermometers, Flare Nuts and Saddles. Nov. 2.

Four and Six Core P.I.L.C.S.W. Cable. Nov. 2.

Garbage Incinerator, Semi-portable type, for Mascot Airport (Quot. 180). Nov. 2.

High Tension Underground Cable and Joint Boxes, for Canberra. Nov. 28.

Line Material, including Insulators, Pins, Shackle Straps, etc. Nov. 2.

Low Tension Underground Cable and Joint Boxes, for Canberra. Nov. 28.

Prefabricated Knock Down Portable Type Cool Rooms. Nov. 2.

Pumping Plant, for Bogan Gate, N.S.W. Nov. 14.

Steam Valves. Nov. 2.

##### GOVERNMENT RAILWAYS DEPARTMENT.

Tyres, for Rolling Stock. Nov. 21.

##### STORES, SUPPLY AND TENDER BOARD.

Disinfectants (Sch. C.T.B. 915). Nov. 23.

##### NEW SOUTH WALES

##### DEPARTMENT OF MAIN ROADS.

Bar Mat Reinforcement. Oct. 31.

Concrete Pipes. Oct. 31.

Insulating Material. Oct. 31.

Power Rippers. Oct. 31.

##### DEPARTMENT OF PUBLIC WORKS.

Air-Conditioning Plant, for Dubbo Base Hospital. Oct. 30.

Crane Scale, 5-ton cap. Nov. 3.

Dishwashing Unit. Nov. 8.

Electric Drill, 5/16 H.D. Nov. 8.

Gas Fire, 7 Radiant. Nov. 8.

Electric Lighting Plant, for Quirindi Aboriginal Station. Nov. 20.

Garage Type, Petrol Driven Compressor. Nov. 3.

Gas Console Heaters. Nov. 3.

Lathe, Drill, Grinder and Oxy

Welding Set. Nov. 3.

Lightning Arresters. Nov. 29.

Out-door Type Potential Transformers, P.M.S.P. Nov. 3.

(Turn to page 79.)

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### NEW TENDERS - Contd.

Passenger Lift, electrically-operated, for Royal Hospital for Women, Paddington. Nov. 13.

Potato Peeler and Food Mixer. Nov. 8.

Steam-heated Sterilising Equipment. Nov. 8.

Water Pressure Gauges. Nov. 8.

Pneumatic Clay Spader. Nov. 3.

Tubular Handrail. Nov. 3.

X-Ray Cassette. Nov. 8.

X-Ray Unit and Accessories, for Mudgee District Hospital. Nov. 13.

### DEPARTMENT OF ROAD TRANSPORT AND TRAMWAYS.

Underground Cable, Multicore Steel Wired Armoured Jute, served and impregnated, for Electromatic Traffic Signals (Spec. S-573). Nov. 13.

### DEPARTMENT OF SUPPLY.

Automatic Telegraph Equipment. Nov. 30.

Bedding and Accessories. Oct. 31.

Bench Stripping Stands for 20mm Guns. Nov. 2.

Dishwashing Machine. Nov. 7.

Drugs and Chemicals. Oct. 31.

Electric Motors, Purchase of. Nov. 7.

Folding Operating Tables. Oct. 31.

Power Transformers. Oct. 31.

### MARITIME SERVICES BOARD.

Steel Roller Shutters (12), for new shed at Darling Harbour (Con. 50/48). Dec. 4.

### FORESTRY COMMISSION.

Bolts, bs. Oct. 31.

Electric Petrol Bowser. Oct. 31.

Germanium Crystal Rectifiers. Oct. 31.

Joinery. Oct. 31.

Motor Truck Seats. Oct. 31.

Steel and Brass Wood Screws. Oct. 31.

Tractor Track Press. Oct. 31.

### METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

Automatic Inlet Control Valves and Control Mechanisms (5). Nov. 14.

Copper Wire Mattresses (240), each 6 ft. 9 in. x 3 ft. 11 in., and Phosphor Bronze Wire Gauze Screens (240), each 6 ft. 9 in. x 3 ft. 11 in. (Quot. 8196). Nov. 6.

Sheet-metal Folding Machine, bench or floor type (Quot. 8187). Nov. 1.

### GOVERNMENT RAILWAYS DEPARTMENT.

Axes, for Locomotives, Tenders and Carriages (Sch. 133). Dec. 31.

Indicating and Recording Instruments, Summation and Remote Metering Protective Relays, Regulating and Rheostat Equipment, and Current Transformers, for Lake Macquarie Power Station (Spec. 1276). Dec. 13.

Multi-cylinder Compression Ignition Oil Engines, flat type (17), approx. 250 B.H.P. at 1,800 R.P.M., and Hydraulic Torque Converters (Spec. 2212). Dec. 6.

Rolled Steel Tyres, for Locomotives, Tenders, Carriages and Wagons (Sch. 131). Dec. 31.

Truck Weighbridges, 35-ton (16), with platforms 16 ft. long by 6 ft. 6 in. wide, equipped with dial indicators and recording heads. Dec. 6.

Used Tubes, Rust Bands and Tyres. Purchase of. Nov. 8.

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All types of finishing — Lacquer, Enamel, Paint, Flock, Wrinkle, Spatter — done for the Trade.

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(Turn to page 80.)

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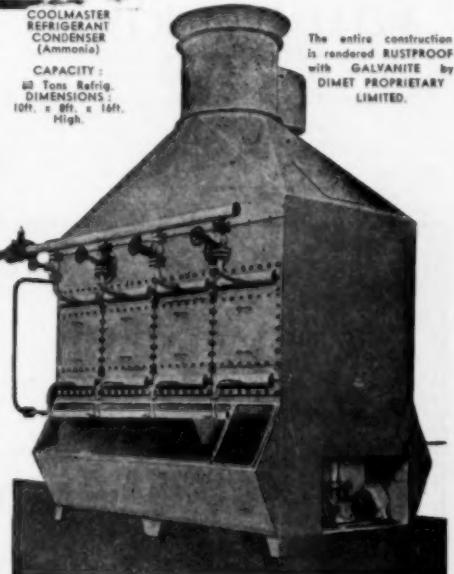
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#### COOLMASTER REFRIGERANT CONDENSER (Ammonia)

CAPACITY :  
40 Tons Refrig.  
DIMENSIONS :  
10ft. x 8ft. x 16ft.  
High.



The entire construction is rendered RUSTPROOF with GALVANITE by DIMET PROPRIETARY LIMITED.

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In Types and Models for :

REFRIGERANT CONDENSING, Model CMC, 1-200 Tons.

WATER COOLING, Model CMW, 8-200 G.P.M.

DIESEL JACKET COOLING, Model CMD, 50-1,000 H.P.

AIR AFTER-COOLING, Model CMA, 50-3,000 C.F.M.

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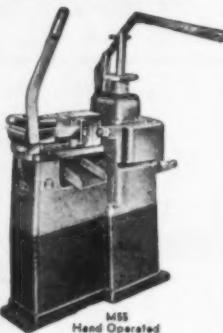
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## NEW TENDERS - Contd.

### STATE CONTRACTS CONTROL BOARD.

- Ballbearing Bench Grinder. Oct. 30.
- Corrugated Cardboard Containers. Nov. 21.
- Letterpress Printing Ink. Nov. 21.
- Men's Waterproof Coats. Oct. 31.
- Monotype and Linotype Metal, Purchase of. Nov. 21.
- Poultry Equipment. Oct. 30.
- School Furniture. Nov. 7.
- Scrap Metal, Purchase of. Nov. 1.
- Screwcutting Bench Lathe. Oct. 30.
- Spray Drying Plant. Nov. 28.
- Woodworking Machinery. Oct. 30.
- Winch. Nov. 9.

### SYDNEY CITY COUNCIL.

- Heavy Duty Trailer Mower Units (3). Oct. 30.
- Steel Reinforcement, for Concrete Mixing Plant. Nov. 7.

### SYDNEY COUNTY COUNCIL.

- Miscellaneous Piping, for Pyrmont "B" Power Station (Spec. 1468). Nov. 23.

Overhead Ash Handling Cranes, for Bunnerong "B" Power Station (Spec. 1481). Nov. 23.

Stoker Ram Boxes, for Bunnerong "A" Power Station (Spec. 1467). Nov. 18.

Supervisory Control Equipments, for City North Sub-station and City Sub-station (Spec. 1457). Jan. 18.

Synchronous Motor Operated Time Switches (Spec. 1487). Nov. 23.

### MISCELLANEOUS.

Blade Graders, 12 ft. (6), new or good second-hand, heavy type four-wheel, preferably with pneumatic tyres, for Snowy Mountains Hydro-Electric Authority. Oct. 31.

Crawler Tractor, approx. 40 h.p., equipped with suitable Angle Blade-Dozer, for Municipality of Casino. Nov. 14.

Outdoor Oil Circuit Breakers (11), 33,000 volt, for Newcastle City Council. Extended to Nov. 27.

Overhead Travelling Crane, 120-ton, for Snowy Mountains Hydro-Electric Authority (Con. 5003). Nov. 18.

Overhead Travelling Crane, 85-ton, for Snowy Mountains Hydro-Electric Authority (Con. 5004). Nov. 13.

Pumping Plant, deep-well type, electrically-driven, for Cooma Water Supply Augmentation (Spec. 120-49/50). Dec. 18.

Pumping Plant, electrically-driven Bore Hole Type, for Mandurran Water Supply (Spec. 114-49/50). Jan. 15.

Refuse Chain Feed with sprockets, return idlers and drive; Unit capable of delivery 4,000 cub. ft. of heated air per minute, with temperature ranging from 160 degrees F-220 degrees F., pressure from 0-5 lb. per square inch, for Municipality of Canterbury. Nov. 6.

(Turn to page 81.)

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Spur, Single Helical, Double Helical, Bevel, Internal, Worm Wheels, Worms with Ground Threads.

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### NEW TENDERS - Contd.

Transformers, 2,200-volt, various sizes and quantities, for North West County Council. Nov. 6.

Switchboard, 11,000-volt, for Sutherland Shire Council. Nov. 27.

### VICTORIA

#### POSTMASTER-GENERAL'S DEPARTMENT.

Packing Cases (Sch. V.420). Nov. 21.

CITY OF MELBOURNE.  
Air Circuit Breakers and Cur-

rent Transformers (Spec. 740/E). Nov. 23.

DEPARTMENT OF SUPPLY.  
Aircraft Clocks, Purchase of. Oct. 31.

Bandsawing Machine. Oct. 31.  
Blackboards, Easels and Easel Pegs. Nov. 2.

Diameter Wheels. Oct. 31.

Flannelette Pyjamas. Oct. 31.  
Glass Jars and Scrap Steel, Purchase of. Oct. 31.

Kitchen Accessories. Nov. 2.  
Miscellaneous Aircraft Hose, Purchase of. Oct. 31.

Power Saw Blades, Purchase of. Nov. 2.

Power Transformers. Oct. 31.  
Rubber Track Blocks. Nov. 2.

Surface Table. Nov. 9.

Tents. Nov. 2.

Tools and Gauges. Nov. 9.

Welding Equipment. Nov. 2.

GOVERNMENT RAILWAYS DEPARTMENT.

Scrap Non-Ferrous Metal, Purchase of. Nov. 1.

MELBOURNE AND METROPOLITAN TRAMWAYS BOARD.

Annual Supplies: Insulators, Tubes and Bushings (Sch. 52); Conduit Fittings (Sch. 54); Mercury Contact Tubes (Sch. 62); Porcelain Resistors (Sch. 64); Porcelain Enamelled Stop Mark Signs (Sch. 72); Telephones and

Radio Valves (Sch. 73); Base Metals and other Alloys (Sch. 77); Non-Ferrous Metal Sheets (Sch. 81); Non-Ferrous Metal Sections and Bars (Sch. 82); Non-Ferrous Metal Tubing (Sch. 83); Bright Mild Steel (Sch. 85); Tool and Special Steels (Sch. 86); Spring Steels (Sch. 87); Conduit Steel, for electrical wiring (Sch. 94); E.W. Pipes and Fittings, A.G. Pipes, Gutter Tiles, Building Bricks, Fire Bricks (Sch. 97); Motor Spirit, Fuel and Lubricating Oils, Greases, etc. (Sch. 100); Steel Sections (Sch. 109); Motor Tyres and Tubes (Sch. 118), (Tender No. 1810). Nov. 6.

(Turn to page 82.)

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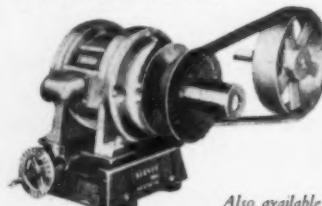
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Also available in Countershaft Units.

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Sizes  $\frac{1}{2}$  H.P. to 1 H.P. They use standard "A" or "B" Section "V"-Ropes.  
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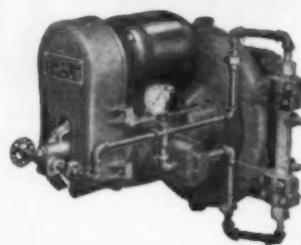
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### NEW TENDERS — Contd.

Stationary Air Compressor, 600 cub. ft. (Tender 1805). Nov. 13.

Ticket Issuing Machines (Tender 1607). Nov. 15.

Double Drum Power Control Units (2). (Con. 63). Front End Loader, (Con. 64), for Ballarat Water Commissioners. Nov. 6.

### QUEENSLAND

#### STATE ELECTRICITY COMMISSION.

Air Break Switches and Earth Leakage Protection Equipment (Spec. 233). Extended to Nov. 15.

Refractory Lanterns (12), 140-watt, with 19 only Auxiliary Units. Nov. 3.

Sets of Resistors (2), for 70 H.P. 3-phase Motor. Nov. 3.

Steel Pipe Light Brackets. Nov. 3.

Switchgear: (132, 66, 22, 11 & 5 KV), Relays and Carrier Current Communication Equipment (Spec. T.F.3). Extended to Jan. 17.

Water Tube Boilers (Spec. 224). Extended to Nov. 15.

STATE STORES BOARD.  
Galvanised Iron, Plain and Corrugated (Tender A150). Nov. 9.

MISCELLANEOUS.  
Fabricated Structural Steel Towers (Spec. 197/50), for Towns Regional Electricity Board. Dec. 4.

### SOUTH AUSTRALIA

DISTRICT CONTRACT BOARD.  
Steel Wheels, 13 in. dia., to take 9.00 tyres, 5 stud fitting,  $\frac{1}{2}$  in. dia. holes, 6J pitch, circle, for stud holes. Oct. 31.

### CURRENT TENDERS

The following tenders have appeared in previous issues and are still current.

### COMMONWEALTH

#### POSTMASTER-GENERAL'S DEPARTMENT.

Bolts, Miscellaneous (Sch. C-6452). Nov. 9.

(Turn to page 83.)

MISCELLANEOUS.  
Automatic Traffic-Control Light System, Supply and Installation, for City of Camberwell (Con. 6/51). Nov. 13.

## FOR ALL TUBE AND PIPE BENDING PROBLEMS

Specialists in  
Steam and Refrigeration Coil Making  
General Pipe Bending and Coppersmithing

Also equipped for  
Arc and Oxy Welding — Fabricating

**W. R. SKINNER**

186 Sussex Street, North Coburg, Victoria

### CURRENT TENDERS — contd.

**Bi-motional Switch Wiper Assemblies and Parts** (Sch. C. 6436). Dec. 19.

**Communication System between Sydney and Melbourne** (Spec. C. 8157). Extended to Jan. 18, 1951.

**Compressed Gases** (Sch. C. 6455). Nov. 9.

**Induction Coils** (Sch. C. 6391). Nov. 2.

**Intercommunication Telephones** (Sch. C. 6384). Nov. 2.

**Interruption Cable** (Sch. C. 6417). Nov. 9.

**Machine Telegraph Equipment** (Sch. C. 6446). Dec. 5.

**Mechanics Tools, Gauges, etc.** (Sch. C. 6411). Nov. 23.

**Pliers and Screwdrivers** (Sch. C. 6418). Nov. 30.

**Portable Power Driven Saws** (Sch. C. 6453). Nov. 14.

**Power Rectifiers** (Sch. C. 6444). Nov. 14.

**Printed Departmental Headed Paper** (Sch. C. 6457). Nov. 9.

**Printed Matter, Memo. and other Books** (Sch. C. 6454). Oct. 31.

**Receivers and Parts** (Sch. C. 6296). Dec. 7.

**Relay Strips and Mountings** (Sch. C. 6419). Dec. 7.

**Resistors and Reactances** (Sch. C. 6437). Dec. 19.

**Spanners** (Sch. C. 6434). Dec. 19.

**Sub-Station Accessories** (Sch. C. 6420). Dec. 7.

**Switchboard Keys** (Sch. C. 6404). Nov. 18.

**Telephone Meters** (Sch. C. 6390). Nov. 9.

**Teleprinter Tables and Silence Covers** (Sch. C. 6439). Oct. 31.

**Television Installation at Sydney** (Sch. C. 6423). Nov. 21.

**Tinware** (Sch. C. 6456). Nov. 16.

**Tools-Adjusters and Binders** (Sch. C. 6429). Dec. 14.

**Tools for Mechanics, Exchange and Sub-station Maintenance** (Sch. C. 6416). Nov. 30.

**Transformers** (Sch. C. 6398). Nov. 18.

**Trunk Test Boards** (Sch. C. 6432). Oct. 31.

### AUSTRALIAN ALUMINIUM PRODUCTION COMMISSION.

**Apron Feeder**, 75 tons per hour (Spec. M.25). Nov. 13.

**Diesel Motor Trucks, heavy-duty** (Spec. M.24). Nov. 13.

**Galvanised Steel Cable Trays** (Spec. E.30). Nov. 20.

**Kier Slurry Pump** (Spec. CH. 9). Nov. 13.

**Mild Steel Billets**, 450 tons 4 in. x 4 in. (Spec. M.28). Nov. 13.

**Rail Track Tippler**, 140 deg. (alternatively 50 deg.). (Spec. M.26). Nov. 20.

**Switchyard Steel Rails**, 27 tons (Spec. E.28). Nov. 13.

**Transformer, single-phase**, 15 K.V.A. (Spec. E.29). Nov. 6.

**Water Piping**, 16,300 ft. (from 6 in. to 1 in.). (Spec. C.7). Nov. 13.

### DEPARTMENT OF CIVIL AVIATION.

**Approach Light Fittings**, high intensity (Sch. 308). Nov. 14.

**Rotating Light Beacons**, for Airport (Sch. 307). Nov. 14.

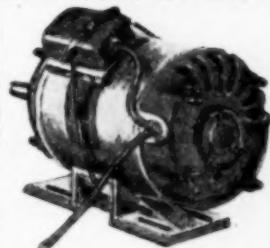
### DEPARTMENT OF WORKS AND HOUSING.

**2 Plate Electric Stoves** (1,000), for Canberra. Nov. 21.

(Turn to page 86.)

## ELECTRIC MOTOR PROTECTION!

### THE OTTER PROTECTIVE THERMOSTAT



The entirely new OTTER principle is 100 per cent. simple and safe. Otter Engineers have developed this unique principle, the only one which eliminates previous drawbacks to thermal overload protection.

The contacts start to COMPRESS as the motor temperature rises to the critical point. At 170° F. the contacts snap open. **TRY IT!** YOU CANNOT FUSE AN OTTER!

It enables a motor to be left running unattended for long periods without risk of fire, overheating and burning out.

The OTTER switches off a motor if it remains running on the starter windings for more than 10 seconds when cold, or 2 seconds when hot. The OTTER also affords progressive current overload protection until a motor reaches a temperature of 170° F., when it is switched OFF.

*Side Australian Distributor:*

**INDUSTRIAL CONTROL COMPANY OF AUST.**  
243 Castlereagh St., Sydney. 'Phones: MA 3448, MA 7689.

### "Reilax" Double-head Bottle Filler fitted with "Auto-Return"

Fills any size bottle to a predetermined level without spill or waste; draws liquids from bulk containers at floor level. Average speed on 26oz. wines or spirits of 50 doz. per hour.

**DISTRIBUTORS:** E. W. Cox, 14 Wentworth Av., Sydney; W. H. Evans, Ltd., 100 Pitt St., Sydney; Simpson Agencies Pty. Ltd., 32-34 Little Lefroy St., Melbourne; Topp and Farmer, Kalimna Chambers, James Place, Adelaide, S.A.

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BOTTLE FILLING EQUIPMENT

**J.W. EARNSHAW PTY LTD.**

189-195 Pacific Highway, North Sydney

Telephone XB 3950

## ELEVATORS and CONVEYORS

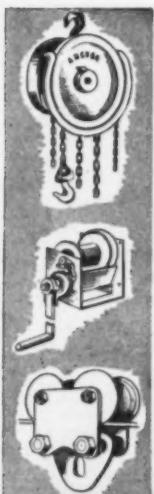


GRAIN ELEVATOR BOOT  
Capacity: 300 tons per hour

**ROBERT BODINGTON** Pty. Ltd.

Engineers

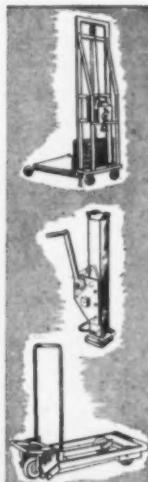
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Established 1856



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HALF TON HIGH-SPEED BLOCKS  
GIRDERS TROLLEYS  
HAND WINCHES  
STACKERS  
LIFTING TRUCKS  
JACKS, RACK AND PINION TYPE  
(ALL STEEL)

Obtainable from Leading Merchants



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**JOHNSON & GASTON PTY. LTD.**

Sales representatives for SYDNEY, BRISBANE, ADELAIDE, PERTH and CHRISTCHURCH, N.Z.

**CURRENT TENDERS — contd.**

Disintegrator Pumping Units and Incidental Equipment, for Nightsailor Depot, Arncliffe. Nov. 15.

Metal Clad Switchboard, 16-panel, 11,000 volt. Supply and delivery to Port Moresby. Nov. 7.

Oil Fired Range, for Bandwidth A.R.A. Field Force. Oct. 31.

Stone Planing Machines (4), for Stone Yard, Canberra. Dec. 12.

**GOVERNMENT RAILWAYS DEPARTMENT.**

Covered Goods Wagons. Extended to Nov. 21.

Diesel Electric Locomotives, 3 ft. 6 in. Jan. 9.

Diesel Electric Locomotives. Nov. 14.

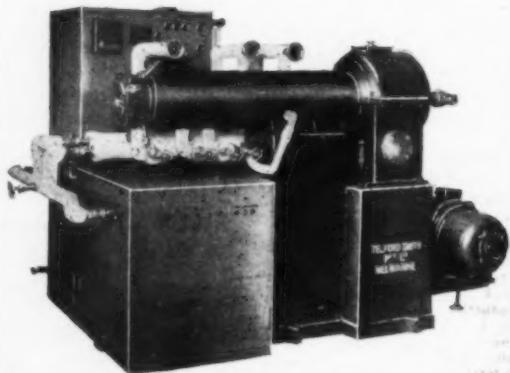
Horizontal Boring Machine. Dec. 12.

Locomotive Firebricks. Oct. 31.

Open Goods Wagons; Freight Car Bogies. Extended to Nov. 21.

## EXTRUDERS for PLASTICS

Plastics Extruders for Tubes, Rods, Monofilaments and Wire Covering. **RIGID AND FLEXIBLE.**



2½ in. OIL-HEATED EXTRUDER

High Temperature Thermostatic Control — instant cooling.  
Electrically-heated head.

**Telford Smith** PTY. LTD.

ENGINEERS

344-346 DORCAS ST., SOUTH MELBOURNE, S.C.S.

PHONES: ASK 1144, 1145

Railway Wheel and Axle Span Riveted Steel Through  
Lathe. Nov. 14. Girder Railway Bridges, 80 ft. (3).

Sleeping Cars. Dec. 12.

Steel Sections and Plates. Oct.

31.

Water Tank Wagons. Nov. 7.

**DEPARTMENT OF MAIN ROADS.**

Steel Bolts and Nuts, 42 tons. Nov. 9.

Steel Plates and Sections, 1,200 tons. Nov. 9.

Steel Reinforcing Bars, 1,300 tons. Nov. 9.

**DEPARTMENT OF PUBLIC WORKS.**

Elevated Tank, M.S., 50,000 gallons. Supply and erect, for Howlong Water Supply (Spec. 46-48/49). Oct. 30.

Hex. Bright Steel Bar (9 tons). Nov. 1.

Pumping Plant, Electrically Driven (Spec. 117-49/50), for Alstonville Water Supply. Nov. 20.

R.D. Steel, "Vibrac" or Equiv. (9 tons). Nov. 1.

R.D. Steel, "Durax" or Equiv. (12 tons). Nov. 1.

R.D. Bright Steel Shafting (12 tons). Nov. 1.

Regulating Transformers, 11-66 KV, for Southern Electricity Supply. Nov. 18.

(Turn to page 88.)

**ELECTRICAR** INDUSTRIAL WORKS TRUCKS

FOR SPECIFICATIONS, INSPECTION, DEMONSTRATION  
CONTACT YOUR STATE DISTRIBUTOR

N.S.W.: Frank J. Hodgson Pty. Ltd., 25-41 Reynolds St., Balmain. (WB 2443).

Qld.: Messrs. Alfred Snashall, Anchor Pty. Ltd., 74-76 Eagle St., Brisbane, S.I. (B 3728).

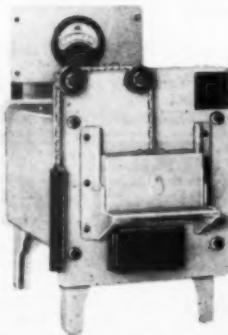
W.A.: Messrs. Wigmore Ltd., 613 Wellington St., Perth. (BA 2280).

S.A.: Power Plant Ltd., 100 Currie St., Adelaide. (Cen. 6633).

State Australian Representatives:

**LIBERTY MOTORS (AUST.) PTY. LTD.**  
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Specially designed for laboratories and heat treatment of small quantities of metal parts. Adequate for all average engineering shop work. Performance fully guaranteed up to 1,000°C.

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BENTONITE**  
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**MAGNESIUM  
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Pure Commercial 98.99%  
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Latrobe Street, MELBOURNE.  
**CAMPBELL BROS. PTY. LTD.**,  
Bowen Hills, BRISBANE.

**CURRENT TENDERS - contd.**

Sewage Ejector Units. Nov. 3.  
Square Key Steel (1½ tons). Nov. 1.

Transformers, 132-46/11 KV, 27 MVA (2), for Southern Electricity Supply. Nov. 11.

**DEPARTMENT OF SUPPLY  
AND DEVELOPMENT.**

Automatic Ice Cream Machines. Nov. 14.

Paint. Oct. 31.

Signal Generators. Oct. 31.

**MARITIME SERVICES BOARD.**

Bar Bending Machine, portable, power-operated (Con. 5046). Oct. 30.

Single End Tenoning Machine (Con. 5047). Nov. 6.

Structural Steel Work, for Sheds of 2 r.c. Ferry Pontoon (Con. 50/44). Oct. 30.

Structural Steelwork, totalling 385.5 tons, for Shed at Pyrmont (Con. 50/42). Jan. 8.

Structural Steelwork, for Filter's Shop (Con. 50/41). Oct. 30.

**METROPOLITAN WATER,  
SEWERAGE AND  
DRAINAGE BOARD.**

C.I. Penstocks (3), 10 ft. diameter (Job 2447). Extended to Oct. 31.

Chain Saw, 72 in., petrol engine driven (Quot. 8155). Nov. 1.

M.S. circ. welded, cement lined pipe fittings, fabricated from Standard 20 ft. x 48 in. dia. M.S. Pipes, supplied by the Board (Job 2456). Oct. 31.

Platform Hoists, Control Gear, etc., 4,000 lb. min. cap. (2, 4, or alternatively 6), Supply and Instal (P.T. 31). Oct. 31.

Pneumatic-tyred Mobile Cranes (2), new or second-hand (P.T. 375). Nov. 28.

Steel Silo, 820-ton cap., Supply and erect, at Warragamba Dam (Job 2453). Oct. 31.

Steam Piping, flanged and bent, approx. 300 ft. of 6 in. nominal bore (Job 2459). Oct. 31.

Steel Wire Rope, for Cableway, (2-½ in. circ., approx. 7,500 ft.; 2-3 in. circ., approx. 6,800 ft.; 2-½ in. circ., approx. 3,400 ft.), (Quot. 8144). Nov. 6.

**STATE CONTRACTS CONTROL  
BOARD.**

Continuous Stationery Type-writers. Nov. 1.

Excavator. Oct. 31.

Medallions, etc. Nov. 7.

Photographic Reproduction Equipment. Nov. 7.

**SYDNEY COUNTY COUNCIL.**

Circuit Breaker Switching Equipment, low voltage, air or oil (Spec. 1456). Jan. 12.

**MISCELLANEOUS.**

Carbonising Plant, consisting of vertical retorts, for Bathurst City Council. Oct. 31.

House Service Meters (6,000), single phase, 240 volt, for Newcastle City Council. Oct. 30.

(Turn to page 86.)



"Check me over, Doc., I'm afraid I've been working too hard since they put in air conditioning!"

**WHAT** happens when a plant is air conditioned?

On the human side, comfortable workers will be able to do more with less effort. They will be less likely to absent themselves. It will be easier to obtain staff. They will be less likely to move to apparently greener pastures.

Precise machinery will not be subjected to radical changes in temperature and humidity. It will be less likely to get out of adjustment. It will "sweat" less . . . corrode less. It will produce a more uniform product.

Air conditioning can keep raw materials uniform, too. And contribute to a more uniform product. Textiles, pharmaceuticals, paper and sweets (to mention a few) may be affected adversely by fluctuating temperatures and humidities. They may turn soft . . . may take on moisture . . . may "spoil."

Over-all, air conditioning removes many of the variables previously introduced by the passing of the seasons, hot spells, rainy spells and changing winds in industrial atmospheres. Why not let a Carrier representative explain the definite advantages and savings to be gained by using Carrier Air Conditioning?

**Carrier**

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GASES and WATER

Simple in design, reliable and accurate in performance. A VALVE TO SUIT ALL CONDITIONS.  
"STANDARD" pattern, where reduced pressure is not less than 2/5ths of inlet pressure.  
"QUOTETITE," where reduced pressure is less than 2/5ths of inlet pressure.  
"FULL BORE" pattern, where large volumes are to be passed.  
Consult your representative for advice and recommendations on pressure regulation and problem. Write for literature.

Australian  
Representatives:

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Light Square, Adelaide. Phone: C 4075.

Interstate Representatives - Old: Baileys & Ridgeway Pty., 318 Adelaide St., Brisbane, N.S.W.; Duff & Macintosh Pty. Ltd., Austral Chambers, 39 Pitt St., Sydney, Vic.; H. W. J. Anderson Pty. Ltd., 35 William St., Melbourne, Tas.; Douglas & Fraser, 41 Paterson St., Launceston, W.A.; Atkins (W.A.), Ltd., 894 Hay St., Perth.

Manufactured by **DAVID AULD & SONS, LTD.**, Glasgow, Scotland  
reducing valve specialists for over 100 years

### CURRENT TENDERS - contd.

Medium Duty Tandem Drive Graders (2), alternatively, one Heavy Duty Tandem Drive Grader; Crawler Tractor Loader, approx. one cub. yd. bucket cap.; Pneumatic-tyred Loaders (2), approx. half cub. yd. cap.; Motor Trucks (3), approx. 3-ton. cap. fitted with tipping bodies; Utility Trucks (3), approx. 10 cwt. alternatively station wagons of approx. 10 cwt. cap.; Pneumatic-tyred Tractor, complete with grass mowing attachment, for City of Parramatta. Nov. 6.

Metal-Clad Switchgear, 11,000-volt, and L. T. for Clarence River County Council (Spec. 95/50). Dec. 20.

Stainless Steel Sheathed Overhead Pilot Cable, for Newcastle City Council. Nov. 6.

Transformers (2), 10,000 K.V.A., 33,000-volt, and (3), 5,000 K.V.A., 33,000-volt, for Newcastle City Council. Oct. 30.

### VICTORIA

GOVERNMENT RAILWAYS  
DEPARTMENT.

Anode Lead Wall Bushing Insulators. Nov. 1.

Bare Hard Drawn Stranded Copper Conductors. Nov. 8.

Centrifugal Sand Pump. Nov. 1.

Copper Plates. Nov. 1.

Galvanised Fencing Wire. Nov. 1.

Lead Acid Batteries. Nov. 15.

Printing Machine, Quad Crown 2-Revolution. Nov. 8.

Roller Bearings. Nov. 1.

CITY OF MELBOURNE.  
Fabricated Structural Steelwork (Spec. 736/E). Extended to Nov. 6.

Street Lighting Lanterns (Spec. 735/E). Dec. 4.

### DEPARTMENT OF PUBLIC WORKS.

Briquette Hot-water Service, for Geelong South. Oct. 31.

Electric Hot-water Service, for Bellarine. Oct. 31.

Fuel Hot-water Service, for Ross Creek. Oct. 31.

Fuel Hot-water Services (2), for Sale. Oct. 31.

Fuel Hot-water Service, for Hastings. Nov. 14.

Fuel Hot-water Service, for Mitta Mitta. Oct. 31.

Fuel Hot-water Service, for State School, Mitta Mitta. Oct. 31.

Hot-water System, for Omeo. Oct. 31.

Passenger Lift for District Hospital, Kynefon. Oct. 31.

Sector Type Spillway Gates (8), 26 ft. x 23 ft., for Somerset Dam. Nov. 27.

### DEPARTMENT OF SUPPLY.

Double Swaging Hammer, Purchase of. Nov. 2.

Electric Motors, various sizes and capacities, mostly D.C. Purchase of. Nov. 7.

### DEPARTMENT OF WORKS AND HOUSING.

Structural Steel Work, for Essendon. Nov. 14.

(Turn to page 87.)

## ELECTRICAL GRID RESISTANCES

One of our many  
Specialties

Contractors to N.S.W. Railways and  
30 years in N.S.W. Tramways.

**TAYLOR & WEARING**  
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1 and 1/2 H.P. and  
Reverse Current Relays

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TO SUIT ANY SURFACE  
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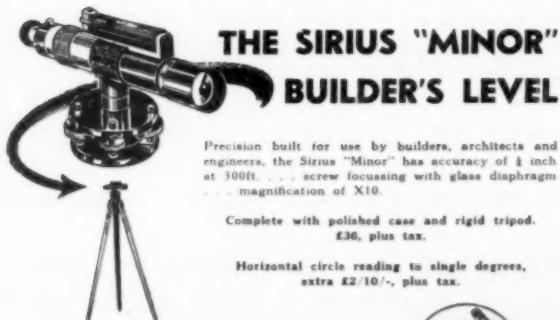
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THE SIRIUS "MINOR"  
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Precision built for use by builders, architects and engineers, the Sirius "Minor" has accuracy of  $\frac{1}{8}$  inch at 300ft. . . . screw focusing with glass diaphragm magnification of X10.

Complete with polished case and rigid tripod.  
£36, plus tax.

Horizontal circle reading to single degrees,  
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SURVEYING, NAUTICAL, INDUSTRIAL & OPTICAL INSTRUMENTS

CURRENT TENDERS — contd.

GRAIN ELEVATORS BOARD.  
Overhead Crane Type Runways,  
Structural Steel supplied. Nov. 27.

MELBOURNE AND METROPOLITAN BOARD OF  
WORKS

C.I. or Asbestos Cement Pressure Pipes, 3 in. dia., 30,000 lin. ft.; 4 in. dia., 100,000 lin. ft.; 6 in. dia., 50,000 lin. ft. Nov. 8.

Crawler Tractors (20), Class 1, 3 and 4, with Dozer Blades and Power Control Units. Nov. 21.

Pressure Pipes, c.i. or asbestos cement: 3-in. dia., 30,000 lin. ft.; 4-in. dia., 100,000 lin. ft.; 6-in. dia., 50,000 lin. ft. Nov. 8.

MELBOURNE HARBOUR  
TRUST.

Radar Equipment, Supply and installation, in the S.H.B. "Chas. A. Phayer." Nov. 3.



PIONEER  
FOR SPRINGS

Est. 1890

Pioneer Spring Co. Ltd., McEvoy  
St. Alexandria, Sydney. MX 2534

P. O. 882

MELBOURNE AND METROPOLITAN TRAMWAYS  
BOARD

Blowout Coils, for Line Breakers, for Tram Cars (Tender 1598). Oct. 30.

Splicing Pieces, for Line Breakers, for Tram Cars (Tender 1599). Oct. 30.

Insulation Plates, for Line Breakers, for Tram Cars (Tender 1601). Oct. 30.

Vitreous Enamelled Resistance Tubes, for Line Breaker, for Tram Cars (Tender 1597). Oct. 30.

POSTMASTER-GENERAL'S  
DEPARTMENT.

First Aid Equipment (Sch. V-388). Oct. 31.

STATE ELECTRICITY COMMISSION.

Copper Conductors and Trolley Wire, Nov. 29.

Lathes, for Central Base Workshops (Spec. 50-51/147). Nov. 22.

Metal Plant Switchgear and Accessories, 20 KVA, 25 Cycles (Spec. 50-51/100). Nov. 22.

Outdoor Switches and Accessories, 22 kV and 66 kV (Spec. 50-51/44). Nov. 1.

Paper Double Braided Aerial Cable (Spec. 50-51/101). Nov. 15.

Paper and Varnished Cambric Insulated Cable. Feb. 7.

Plate Girder Bridges (Spec. 50-51/116). Nov. 22.

Portable Air Compressors (Spec. 50-51/136). Nov. 1.

Single Phase, A.C. Kilowatt Hour Meters (Spec. 50-51/111). Nov. 15.

Sleeper Plates, for Movable Rail and Dredger Tracks. Nov. 8.

Steel Forms and Concrete Buckets. Nov. 15.

(Turn to page 88.)

ADDITIONAL  
S-T-R-E-N-G-T-H  
and Protection for  
Your Products  
with



TOUGH  
2-PLY KRAFT  
with Bitumen Centre

● Reinforced Three ways with Twine

Reinforced FISH-BAK is a fine surfaced wrapping material suitable for use where more harsh surfaces might scratch. Reinforced FISH-BAK is double faced with smooth, strong Kraft internally reinforced with twine and Plastic Bitumen.

Reinforced FISH-BAK  
Waterproof as a Fish's Back

is the ideal wrap for all goods requiring real protection against moisture and air, such as foodstuffs, chemicals, clothing, woollens, leather and commodities subject to loss through damp.

A special cement makes the package airtight when long-distance transport is planned.

Reinforced FISH-BAK is supplied in any width up to 72 inches, and in rolls 300 to 3,000 feet.

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CURRENT TENDERS - contd.

Trailing Cable, V.R.L., T.R.C.,  
6.6 K.V. (Spec. 50-51/68). Nov. 15.

STATE RIVERS AND WATER  
SUPPLY COMMISSION.

12 Cusec Centrifugal Pump. Oct. 31.

16-run Combines (2). Oct. 31.  
25 H.P. Pneumatic Tyred Trac-

tors (6). Oct. 31.

65 H.P. Diesel Engine at Jung  
Dosen Pumping Station. Oct. 31.

Pneumatic Tyred Front End

Tractor Loader. Oct. 31.

MISCELLANEOUS.

Centrifugal Pump, 3-inch, 3-  
stage, and Electric Motor, 15 h.p.,  
7,000 cap. Purchase of, from  
Talangatta Waterworks Trust. Oct. 30.

Salt Glazed or Concrete Pipes,  
9 in. and 6 in., for Geelong Water-  
works and Sewerage Trust. Nov. 9.

Trench Cutting Machine and  
Spare Parts; Portable Air Com-  
pressor Plant, complete with Ac-  
cessories; Pressure Water Pipes,  
4 in. and 1½ in. Internal Dia., for  
Geelong Waterworks and Sewer-  
age Trust. Nov. 21.

QUEENSLAND

IRRIGATION AND WATER  
SUPPLY COMMISSION.

Flow Metering Equipment, Re-  
cording and Integrating, for Clare  
(Job 1668). Oct. 30.

Shovels, 1½ cub. yd. (4), new or  
re-conditioned. Nov. 3.

Tracked Crane, with 70 ft. boom,  
to lift 15 cwt. at 25 ft. radius, and  
complete with 1 cub. yd. Dragline  
Equipment. Nov. 3.

DEPARTMENT OF CO-  
ORDINATOR GENERAL OF  
PUBLIC WORKS.

Spillway Gates (8), Sector Type,  
20 ft. x 23 ft., for Somerset Dam.  
Nov. 27.

IRRIGATION AND WATER  
SUPPLY COMMISSION.

Crane, Rubber-tyred, Tractor-  
type (1). Nov. 3.

Diesel Generators, 100 KVA, 415-  
volt, 3-phase, (2). Nov. 3.

Rock Drills (30), approx. weight  
45-50 lbs. Nov. 3.

Tipping Trucks or Rock Buggies,  
Diesel Steel-bodied, approx.  
6 cub. yd. cap. (12). Nov. 3.

Welding Sets, portable internal  
combustion, 300 to 400 amp. (2).  
Nov. 3.

STATE ELECTRICITY COM-  
MISSION.

Crane Runway (Spec. 172).  
Nov. 15.

(Turn to page 88.)



**LYSAGHT'S**  
100% AUSTRALIAN MADE, FROM AUSTRALIAN MATERIAL  
Specify "LYSAGHT'S" WIRE, WIRE NETTING, Etc.

WIRE  
Fencing and all  
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Black, Black Oiled  
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All Grades.

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CURRENT TENDERS — contd.

Distribution Materials (Spec. 245), Nov. 1.

Hard-Drawn Bare Copper Cable (Spec. 246), Nov. 8.

Main Transformers, 152, 66, 22, 11 and 5.5 kV. (Spec. T/F 2). Dec. 13.

Oil-Engine-driven Electrical Generating Plant (Spec. 240). Dec. 6.

Oil Storage Tanks (Spec. 242). Nov. 22.

Transformers, 3 phase and single phase (Spec. 241). Dec. 6.

Turbo-Alternators (3), water-driven, 11,000 V., 18,000 kW (Spec. T/F 1). Nov. 29.

Wood Burning Gas Producers (Spec. 247). Dec. 20.

STATE STORES BOARD.

Grab Crane, 3 cub. yd. cap.; Mine Bucket, 3 cub. yd. cap.; Heavy Plate Grab Bucket. Nov. 14.

Steel Wire Rope. Oct. 31.

MISCELLANEOUS.

Fork End Loader (Spec. 199/50), for Townsville Regional Electricity Board. Nov. 6.

Plan Printing Machines, for Cairns Regional Electricity Board (Con. L50/21). Jan. 23.

Switchgear, Relays and Instruments, for Cairns Regional Electricity Board. Dec. 6.

Switchgear, 22,000 and 6,000 volt, for Cairns Regional Electricity Board (Con. L50/20). Dec. 13.

SOUTH AUSTRALIA

SUPPLY AND TENDER BOARD.

Coal Grabs (2), for Adelaide Oct. 30.

WEST AUSTRALIA

GOVERNMENT TENDER BOARD.

Cast Manganese Steel Railway Crossings. Dec. 21.

Crane, 1 ton (Sch. 523A). Nov. 9.

Forging Machine, for Railways. Nov. 16.

Mobile Crane, Wheel Mounted Dec. 14.

Pumping Machinery, for Kalundum Pumping Station (Sch. 499A). Nov. 9.

Railway Wagon Equipment. Dec. 7.

Steam Raising Plant, for Colle Power Station. Dec. 14.

Steel Sections, for Railways. Nov. 16.

Telephone Exchange, automatic. Dec. 14.

TASMANIA

HYDRO-ELECTRIC COMMISSION.

Crusher Plant Feeders (C.E. 213). Nov. 22.

Pneumatic Concrete Placing Gun (C.E. 190). Nov. 15.

Side-Tipping Mine Cars, Brandy-Type. 4-cub. yd. cap. (12). (C.E. 221). Nov. 21.

NEW ZEALAND

HYDRO ELECTRIC DEPARTMENT.

Filtration Plant at Tauranga Borough Council. Nov. 28.

Switchgear, steelwork, 110 kV. Nov. 14.

Outdoor Switchgear and Steel-work, 50 kV (Con. 160). Nov. 28.

Synchronous Condensers (3), 30,000 kVA. Nov. 21.

Transformer Bank and Spare Unit, 50 MVA, 220/110/11 kV. Nov. 7.

MISCELLANEOUS.

Filtration Plant (Con. 126). Nov. 28.

DEPARTMENT OF RAILWAYS—  
NEW SOUTH WALES.

TENDERS enclosed in sealed envelopes which must be endorsed "TENDER FOR ....", addressed to the Commissioner for Railways, 19 York Street, Sydney, will be received on the date and time shown for services specified. Tenders may be lodged in the Tender Box, Room 504A, 5th Floor, Railway House, 19 York Street, Sydney, or posted to the above address.

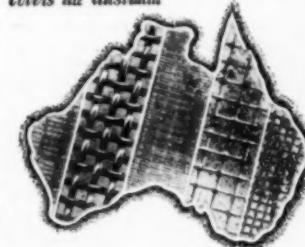
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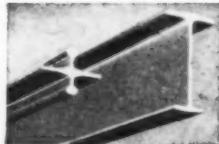
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